DRAFT ENVIRONMENTAL IMPACT REPORT

PIER 70 MIXED-USE DISTRICT PROJECT



CITY AND COUNTY OF SAN FRANCISCO
PLANNING DEPARTMENT: CASE NO. 2014-001272ENV

STATE CLEARINGHOUSE NO. 2015052024

DRAFT EIR PUBLICATION DATE: DECEMBER 21, 2016

DRAFT EIR PUBLIC HEARING DATE: FEBRUARY 9, 2017

DRAFT EIR PUBLIC COMMENT PERIOD: DECEMBER 22, 2016 - FEBRUARY 21, 2017

Written comments should be sent to:

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Acting Environmental Review Officer
San Francisco Planning Department
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TO: Distribution List for the Pier 70 Mixed-Use District Project Draft EIR

FROM: Lisa M. Gibson, Acting Environmental Review Officer

SUBJECT: Request for the Final Environmental Impact Report for the Pier 70 Mixed-Use District Project (Planning Department File No. 2014-001272ENV)

This is the Draft of the Environmental Impact Report (EIR) for the Pier 70 Mixed-Use District Project. A public hearing will be held on the adequacy and accuracy of this document. After the public hearing, our office will prepare and publish a document titled "Responses to Comments," which will contain all relevant comments on this Draft EIR and our responses to those comments. It may also specify changes to this Draft EIR. Those who testify at the hearing on the Draft EIR will automatically receive a copy of the Responses to Comments document, along with notice of the date reserved for certification; others may receive a copy of the Responses to Comments document and notice by request or by visiting our office. This Draft EIR together with the Responses to Comments document will be considered by the Planning Commission in an advertised public meeting and will be certified as a Final EIR if deemed adequate.

After certification, we will modify the Draft EIR as specified by the Responses to Comments document and print both documents in a single publication called the Final EIR. The Final EIR will add no new information to the combination of the two documents except to reproduce the certification resolution. It will simply provide the information in one document, rather than two. Therefore, if you receive a copy of the Responses to Comments document in addition to this copy of the Draft EIR, you will technically have a copy of the Final EIR.

We are aware that many people who receive the Draft EIR and Responses to Comments document have no interest in receiving virtually the same information after the EIR has been certified. To avoid expending money and paper needlessly, we would like to send copies of the Final EIR [in Adobe Acrobat format on a CD] to private individuals only if they request them. Therefore, if you would like a copy of the Final EIR, please fill out and mail the postcard provided inside the back cover to the Environmental Planning division of the Planning Department within two weeks after certification of the EIR. Any private party not requesting a Final EIR by that time will not be mailed a copy. Public agencies on the distribution list will automatically receive a copy of the Final EIR.

Thank you for your interest in this project.

PIER 70 MIXED-USE DISTRICT PROJECT
DRAFT ENVIRONMENTAL IMPACT REPORT

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LIST OF ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway Transportation Officials
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC Transit	Alameda-Contra Costa Transit
ACL	absolute cumulative limit
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADRP	archaeological data recovery plan
AIC	American Industrial Center
ALS	advanced life support
AMP	archaeological monitoring program
AMS	Applied Marine Sciences
APC	automated passenger count
APEZ	Air Pollutant Exposure Zone
API	Associated Press International
AQI	Air Quality Index
AQTR	Air Quality Technical Report
ARDTP	Archaeological Research Design and Treatment Plan
ASCE	American Society of Civil Engineers
ATCM	Airborne Toxic Substances Control Measure
ATP	archaeological testing plan
AWCS	Automated Waste Collection System
AWSS	auxiliary water supply system
BA	Biological Assessment
BAAQMD	Bay Area Air Quality Management District
BABS	Bay Area Bike Share
BART	Bay Area Rapid Transit
BCC	Bird of Conservation Concern
BCDC	San Francisco Bay Conservation and Development Commission
Bcf	billion cubic feet
Bcf/year	billion cubic feet per year
bgs	below ground surface
BLIP	Branch Library Improvement Program
BLS	basic life support
BMP	Best Management Practice
BO	Biological Opinion
BPG	Building Permit Group
BRT	Bus Rapid Transit
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTLC	Board of the Tide Land Commissioners
Btu	British Thermal Units
CalOSHA	State Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CC&Rs	Covenants Conditions and Restrictions
CCR	California Code of Regulations
CCSF	City and County of San Francisco
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CHPS	California Collaborative for High Performance Schools
CIWMA	California Integrated Waste Management Act
CIWMB	California Integrated Waste Management Board
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2E	carbon dioxide-equivalent measures
CPC	Capital Planning Committee
CPE	Community Plan Exemption
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources

CRPR	California Rare Plant Rank
CSC	California Species of Special Concern
CSD	combined sewer discharge
CSO	Combined Sewer Overflow
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
D4D	Design for Development
dB(s)	decibel(s)
dBA	decibel A-weighting
DBI	Department of Building Inspection
DDA	Disposition and Development Agreement
DEHP	di (2 ethylhexyl) phthalate
DEM	Department of Emergency Management
DNAPL	dense nonaqueous phase liquid
DOT	Department of Transportation
DPH	Department of Public Health
DPM	diesel particulate matter
DPR	Department of Parks and Recreation
DPW	Department of Public Works
DTSC	Department of Toxics Substances Control
EFH	essential fish habitat
EIR	Environmental Impact Report
EMS	Emergency Management Services
EMT	emergency medical technician
ENA	Exclusive Negotiating Agreement
EO	Executive Order
EPA	Environmental Protection Agency
ERO	Environmental Review Officer
ESA	Environmental Science Associates
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
ESLRA	ecological screening level risk assessment
FARR	Final Archaeological Resources Report
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FMP	fishery management plan
FR	Federal Register
FS/RAP	Feasibility Study/Remedial Action Plan
FTA	Federal Transit Administration
g	gravity
GGNRA	Golden Gate National Recreation Area
GHG	greenhouse gas
GIS	geographic information system
gpd	gallons per day
gpf	gallons per flush
gpm	gallons per minute
gsf	gross square feet
GWP	Global Warming Potential
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HCD	California Department of Housing and Community Development
HCM	Highway Capacity Manual
HDPE	high-density polyethylene
HEPA	high efficiency particulate air
HHRA	Human Health Risk Assessment
HI	Hazard Index
HMBP	hazardous materials business plan
HOV	high-occupancy vehicle
HRA	health risk assessment
HRER	Historic Resource Evaluation Response
HUD	U.S. Department of Housing and Urban Development
HVAC	heating/ventilation/air conditioning
Hz	hertz
IEP	Interagency Ecological Program
IHA	Incidental Harassment Authorization
in/sec	inches per second
ITE	Institute of Transportation Engineers
kV	kilovolt
kVA	kilovolt amps
kW	kilowatt
kWh	kilowatt-hours
L_{dn}	day-night noise level
LEED®	Leadership in Energy and Environmental Design
Leq (24)	steady-state acoustical energy level measured over a 24-hour period.
Leq	steady-state energy level
LID	low impact development
Lmax	maximum, instantaneous noise level registered during a measurement period
LOS	Levels of Service

LTMS	Long-Term Management Strategy
MBBTCC	Mission Bay Ballpark Transportation Coordination Committee
MBTA	Migratory Bird Treaty Act
MEISR	Maximum Exposed Individual Sensitive Receptor
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mgd	million gallons per day
MHHW	Mean Higher High Water
MLD	Most Likely Descendant
MLP	maximum load point
MMBtu	million BTU
MMPA	Marine Mammal Protection Act
MMRP	Mitigation Monitoring and Reporting Program
$MMTCO_2E$	million metric tons of CO_2-equivalent
mph	mile(s) per hour
MRZ	Mineral Resource Zone
MS4	Municipal Separate Storm Sewer System
MT	metric tonne
MTA	Municipal Transportation Agency
$MTCO_2E$	million gross metric tons of CO_2E
Muni	San Francisco Municipal Railway
MW	megawatt(s)
Mw	moment magnitude
MWh	million megawatt-hours
N_2O	nitrous oxide
N_2O	ozone
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NAPL	non-aqueous phase liquid
NAVD88	North American Vertical Datum 1988
NB	Northbound
NCP	National Contingency Plan
NEMA	National Electrical Manufacturers Association
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
ng/m^3	nanograms per cubic meter
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRC	National Research Council
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
OCII	Office of Community Investment and Infrastructure
OEHHA	Office of Environmental Health Hazard Assessment
OEWD	Office of Economic Workforce and Development
OHP	Office of Historic Preservation
OHWM	ordinary high water mark
OITC	Outdoor/Indoor Transmission Class
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCO	Parking Control Officer
PDA	Priority Development Area
PDR	Production, Distribution, Repair
PDT	Pacific Daylight Time
PG&E	Pacific Gas and Electric Company
PM	particulate matter
PM_{10}	PM of 10 microns in diameter or less
$PM_{2.5}$	PM of 2.5 microns in diameter or less
POPOS	privately owned public open space
Port	Port of San Francisco
ppb	parts per billion
pphm	parts per hundred million
ppm	parts per million
PPV	peak particle velocity
PRMMP	Paleontological Resources Monitoring and Mitigation Program
PSA	Park Service Area
psi	pound per square inch
PST	Pacific Standard Time
PV	photovoltaic
QACL	Qualified Archeological Consultants List
QSD	Qualified SWPPP Developer
RALI	retail/arts/light-industrial
RBTC	risk-based target concentration
RCRA	Resource Conservation and Recovery Act
RHNA	Regional Housing Need Allocation

RMP	Risk Management Plan
RMS	root mean square
ROG	reactive organic gas
ROSE	Recreation and Open Space Element
RPD	Recreation and Parks Department
RPP	residential permit parking
RPS	Renewable Portfolio Standard
RWQCB	Regional Water Quality Control Board
SAAQS	state ambient air quality standards
SamTrans	San Mateo County Transit
SB	Senate Bill
SB	Southbound
SDC	Seismic Design Category
SEI	Structural Engineering Institute
SEL	sound exposure level
SEWPCP	Southeast Water Pollution Control Plantsf square feet
SFBAAB	San Francisco Bay Area Air Basin
SFCD	San Francisco City Datum
SFCHAMP	San Francisco Chained Activity Model Process
SFCTA	San Francisco County Transportation Authority
SFFD	San Francisco Fire Department
SFMTA	San Francisco Municipal Transportation Agency
SFO	San Francisco International Airport
SFPA	San Francisco Parks Alliance
SFPD	San Francisco Police Department
SFPUC	San Francisco Public Utilities Commission
SFPW	San Francisco Public Works
SFUSD	San Francisco Unified School District
SLIC	Spills, Leaks, Investigation and Cleanup
SLR	sea level rise
SMM	Sims Metals Management
SMP	Site Management Plan
SMR	Stormwater Management Requirements and Design Guidelines
SO_2	sulfur dioxide
SOMA	South of Market
STC	Sound Transmission Class
STLC	soluble threshold limit concentration
SUD	Special Use District
SVOC	semivolatile organic compound
SVP	Society for Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TASC	Transportation Advisory Staff Committee
TAZ	transportation analysis zone
TC	Transportation Coordinator
TCLP	Toxicity Characteristic Leaching Procedure
TDM	Transportation Demand Management
TIC	tenancies in common
TIS	Transportation Impact Study
TMA	Transportation Management Agency
TMDL	total maximum daily load
TNC	transportation network company
TOG	total organic gas
TPH	total petroleum hydrocarbons
tpy	tons per year
TSP	Transit Signal Priority
TSP	Transit Signal Priority
TTLC	total threshold limit concentration
UCSF	University of California, San Francisco
UIW	Union Iron Works
USC	United States Code
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USF	University of San Francisco
USFWS	U.S. Fish and Wildlife Society
USGS	U.S. Geological Survey
USSC	United States Shipbuilding Company
UST	underground storage tank
UWMP	Urban Water Management Plan
VACC	Vibro-Acoustic Consultants
VDECS	Verified Diesel Emission Control Strategies
VMT	vehicle miles traveled
VOC	volatile organic compound
WDR	Waste Discharge Requirements
WEAP	Worker Environmental Awareness Program
WHO	World Health Organization
WLUP	Waterfront Land Use Plan
WSA	Water Supply Assessment
WSIP	Water System Improvement Program

WTA	Waterfront Transportation Assessment	µg(s)	microgram(s)
		µg/L	micrograms per liter
WTRS	Wastewater Treatment and Reuse System	$\mu g/m^3$	micrograms per cubic meter
		µPa	microPascal

SUMMARY

This Summary chapter is intended to highlight major areas of importance in the environmental analysis as required by Section 15123 of the California Environmental Quality Act (CEQA) Guidelines. This chapter briefly summarizes the Pier 70 Mixed-Use District Project (referred to in this Environmental Impact Report [EIR] as "the Proposed Project").

To cover a full range of potential land uses that could be developed under the proposed Special Use District (SUD), this EIR analyzes a maximum residential-use scenario and a maximum commercial-use scenario for the project site (i.e., Maximum Residential Scenario and Maximum Commercial Scenario). Three options for sewer/wastewater treatment, three options for grading around Building 12, and an option for pedestrian passageways are evaluated in this EIR. The Proposed Project also includes four variants that consider modifications to the proposed infrastructure and building systems to enhance sustainability. The EIR analyzes three alternatives to the Proposed Project including a No Project Alternative, Code Compliant Alternative, and 2010 Port Master Plan Alternative.

Following the synopsis of the Proposed Project and scenarios, and its project options and variants, a summary table presents the environmental impacts of the Proposed Project and its project variants, and mitigation and improvement measures identified to reduce significant impacts. Following the summary tables is a description of the alternatives to the Proposed Project that are addressed in this EIR and a table comparing the impacts of those alternatives with the Proposed Project. The final subsection in this chapter is a summary of environmental issues to be resolved and areas of known controversy.

Table S.1: Summary of Impacts of Proposed Project, beginning on p. S.7, provides an overview of the following:

- Environmental impacts with the potential to occur as a result of the Proposed Project and project variants, scenarios, and options;
- The level of significance of the environmental impacts before implementation of any applicable mitigation measures;
- Mitigation measures that would avoid or reduce significant environmental impacts;
- Improvement measures that would reduce less-than-significant impacts; and
- The level of significance for each impact after the mitigation measures are implemented.

A. PROJECT SYNOPSIS

The Pier 70 area (Pier 70) encompasses 69 acres of historic shipyard property along San Francisco's Central Waterfront. Under the Burton Act, Pier 70 is owned by the City and County

of San Francisco (City) through the Port Commission of San Francisco (Port or Port Commission).[1] The Port intends to rehabilitate or redevelop Pier 70 and has selected Forest City Development California, Inc. (Forest City) to act as master developer for 28 acres of the site and initiate rezoning and development of design standards and controls for a multi-phased, mixed-use development on that site and two adjacent parcels.[2] As envisioned, the proposed Pier 70 Mixed-Use District Project would include market-rate and affordable residential uses, commercial use, retail/arts/light-industrial (RALI) uses,[3] parking, shoreline improvements, infrastructure development and street improvements, and public open space. Together, the Port and Forest City are the project sponsors for the Proposed Project.

The proposed Pier 70 Mixed-Use District Project, for which this project-level EIR has been prepared, comprises a project site of an approximately 35-acre area bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. The project site is south of Mission Bay, east of the Potrero Hill and Dogpatch[4] neighborhoods, and within the northeastern portion of San Francisco's *Central Waterfront Area Plan*, one of four areas covered by the *Eastern Neighborhoods Rezoning and Area Plans (Eastern Neighborhoods Plan)*. The project site is located within Pier 70, except for the 3.6-acre parcel adjacent to Pier 70's southwest corner, known as the Hoedown Yard, which is owned by the Pacific Gas and Electric Company (PG&E). [5]

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1 The Burton Act (Chapter 1333 of the Statutes of 1968) was adopted by the California Legislature in 1968. Under the Burton Act and the companion Burton Act transfer agreement, the State transferred ownership of the tidelands making up San Francisco harbor to the City, with the requirement that the City form a Port Commission with complete authority to use, operate, manage, and regulate the granted lands.

2 The Port and Forest City entered into an Exclusive Negotiating Agreement in July 2011 as authorized by Port Commission Resolution No. 11-49. The Port Commission subsequently endorsed a Term Sheet outlining features of the Proposed Project, which the San Francisco Board of Supervisors endorsed in June 2013 by Resolution No. 201-13.

3 The project sponsors describe the RALI use as including neighborhood retail, arts, eating and drinking places, production distribution and repair, light manufacturing, and entertainment establishments, which are collectively referred to for the purposes of this EIR as RALI uses.

4 The Dogpatch neighborhood is bounded by Mariposa Street to the north, I-280 to the west, Cesar Chavez Street to the south, and Illinois Street to the east.

5 Under an option agreement with PG&E, the City has an option to purchase the Hoedown Yard. PG&E has consented to including the Hoedown Yard in the project sponsors' rezoning efforts; however, the City will not exercise its option to purchase the Hoedown Yard, and development of this parcel may not proceed, unless PG&E locates a suitable relocation site for the current utility operations at the Hoedown Yard. PG&E's consent is reflected in the letter from Kendrick Li, Supervisor Land Acquisition Development, PG&E, to Brad Benson, Port of San Francisco, regarding the Hoedown Yard, June 6, 2014. A copy of this letter is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2014.001272E. The environmental analysis assumes that the City will exercise its option with PG&E, and will subsequently purchase the Hoedown Yard.

Two development areas constitute the project site. The "28-Acre Site" is an approximately 28-acre area located between 20th, Michigan, and 22nd streets and San Francisco Bay that includes Assessor's Block 4052/Lot 001 and Lot 002 and Block 4111/Lot 003 and Lot 004. The "Illinois Parcels" form an approximately 7-acre site that consists of an approximately 3.4-acre Port-owned parcel, called the "20th/Illinois Parcel," along Illinois Street at 20th Street (Assessor's Block 4110/Lot 001) and the approximately 3.6-acre "Hoedown Yard," at Illinois and 22nd streets (Assessor's Block 4120/Lot 002 and Block 4110/Lot 008A), which is owned by PG&E. The Hoedown Yard includes a City-owned 0.2-acre portion of street right-of-way that bisects the site.[6]

The Proposed Project would amend the *San Francisco General Plan* (*General Plan*) and Planning Code, adding a new Pier 70 SUD, which would establish land use zoning controls for the project site and incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development* document (*Design for Development*).[7] All new construction at the project site must be consistent with the *Design for Development.* The Zoning Maps would be amended to show changes from the current zoning (M-2 [Heavy Industrial] and P [Public]) to the proposed SUD zoning. Height limits on the 28-Acre Site would be increased from 40 feet to 90 feet, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet, as authorized by Proposition F in November 2014. The Planning Code text amendments would also modify the existing height limits on an eastern portion of the Hoedown Yard from 40 to 65 feet. Height limits are further restricted through the design standards established in the proposed *Design for Development*. The Proposed Project would also amend the Port's *Waterfront Land Use Plan*.

Under the proposed SUD, the Proposed Project would provide a phased mixed-use land use program in which certain parcels could be developed for either primarily commercial uses or residential uses, with much of the ground floor dedicated to RALI uses. In addition, two parcels on the project site (Parcels C1 and C2) could be developed for structured parking or for residential/commercial or residential use, depending on future market demand for parking and future travel demand patterns. Development of the 28-Acre Site would include up to a maximum of approximately 3,422,265 gross square feet (gsf) of construction of new buildings and improvements to existing structures (excluding basement-level square footage allocated to accessory and district parking). New buildings would have maximum heights of 50 to 90 feet. Development of the Illinois Parcels would include up to a maximum of approximately 801,400 gsf in new buildings; these new buildings would not exceed a height of 65 feet, which is the

[6] The 0.2-acre Michigan Street right-of-way is a recorded easement; however, no physical roadway exists.

[7] The proposed *Pier 70 Design for Development* document, which is included as part of the Proposed Project, would set forth the underlying vision and guidelines for development of the project site, and establish standards and design guidelines to implement the intended vision and principles.

existing height limit along Illinois Street on both the Port-owned and the western portion of the Hoedown Yard.

The majority of the project site is located within the Union Iron Works Historic District, which is listed in the National Register of Historic Places (National Register) in recognition of Pier 70's role in the development of steel shipbuilding in the United States and for industrial architecture built at the site between 1884 and the end of World War II. The 28-Acre Site contains 12 of the Historic District's 44 contributing historic resources and one of the ten non-contributing resources. With implementation of the Proposed Project, three contributing resources (Buildings 2, 12, and 21) would be rehabilitated in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and adapted for reuse; one (the existing remnant of Irish Hill[8]) would be mostly retained; and seven structures and sheds (Buildings 11, 15, 16, 19, 25, 32, and 66), containing 92,945 gsf, would be demolished. The Port has proposed to demolish the 30,940-gsf Building 117, located on the project site, prior to approval of the Proposed Project as part of the Historic Core Project.[9,10] The single non-contributing resource on the project site (Slipways 5 through 8, which are currently covered by fill and asphalt) would be partially demolished.

The Proposed Project includes transportation and circulation improvements, new and upgraded utilities and infrastructure, geotechnical and shoreline improvements, and 9 acres of public open space. Three options for sewer/wastewater treatment, three options for grading around Building 12, and an option for pedestrian passageways are evaluated in this EIR. The Proposed Project also includes four variants that consider modifications to the proposed infrastructure and building systems to enhance sustainability.

B. SUMMARY OF IMPACTS AND MITIGATION MEASURES

The Planning Department published Notice of Preparation (NOP) on May 6, 2015, announcing its intent to prepare and distribute an EIR (the NOP is presented as Appendix A to this EIR). Topics analyzed in the EIR are Land Use and Land Use Planning; Population and Housing; Cultural Resources; Transportation and Circulation; Noise and Vibration; Air Quality; Greenhouse Gas Emissions; Wind and Shadow; Recreation; Utilities and Service Systems; Public Services; Biological Resources; Geology and Soils; Hydrology and Water Quality; Hazards and Hazardous Materials; Mineral and Energy Resources; and Agricultural and Forest Resources.

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[8] Today, approximately 1.4 acres remain from the original 20.6 acres of Irish Hill.

[9] San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

[10] Building 117 is proposed for demolition as part of the 20th Street Historic Core project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code.

All impacts of the Proposed Project and its variants, scenarios, and options, and associated mitigation measures and improvement measures identified in this EIR are summarized in Table S.1. These impacts are listed in the same order as they appear in the text of Chapter 4, Environmental Setting and Impacts, of this EIR. For all of the topics evaluated in the EIR, the levels of impacts, with any applicable mitigation measures, are identified as:

- **No Impact** – No adverse changes (or impacts) to the environment are expected.
- **Less Than Significant** – Impact that does not exceed the defined significance criteria or would be eliminated or reduced to a less-than-significant level through compliance with existing local, State, and Federal laws and regulations.
- **Less Than Significant with Mitigation** – Impact that is reduced to a less-than-significant level through implementation of the identified mitigation measures.
- **Significant and Unavoidable with Mitigation** – Impact that exceeds the defined significance criteria and can be reduced through compliance with existing local, State, and Federal laws and regulations and/or implementation of all feasible mitigation measures, but cannot be reduced to a less-than-significant level.
- **Significant and Unavoidable** – Impact that exceeds the defined significance criteria and cannot be eliminated or reduced to a less-than-significant level through compliance with existing local, State, and Federal laws and regulations and for which there are no feasible mitigation measures.

Where applicable, this table identifies project revisions or conditions, expressed as mitigation measures that would reduce the identified impact(s) to less-than-significant levels. The impact's level of significance after implementation of the required mitigation measure is provided in the column labeled "Level of Significance after Mitigation." All mitigation measures and improvement measures that are applicable to the Proposed Project are also applicable to each of the project variants.

This table should not be relied upon for a thorough understanding of the Proposed Project and its impacts and mitigation needs, but is presented for the reader as an overview of project impacts, mitigation measures, and improvement measures. Please see the relevant environmental topic sections in Chapter 4, Environmental Setting and Impacts, for a thorough discussion and analysis of the impacts of the Proposed Project and its project variants, scenarios, and options, and alternatives, and the mitigation measures identified to address those impacts.

As described below in Table S.1, this EIR identifies ten significant and unavoidable impacts of the Proposed Project. It would:

- Cause one individual Muni route (48 Quintara/24th Street bus routes) to exceed 85 percent capacity utilization in the a.m. and p.m. peak hours in both the inbound and outbound directions;

- Cause loading demand during the peak loading hour to not be adequately accommodated by proposed on-site/off-street loading supply or in proposed on-street loading zones, which may create hazardous conditions or significant delays for transit, bicycles, or pedestrians;
- Contribute considerably to significant cumulative transit impacts on the 48 Quintara/24th Street and 22 Fillmore bus routes;
- Cause a substantial temporary or periodic increase in ambient noise levels during construction in the project vicinity above levels existing without the project;
- Cause substantial permanent increases in ambient noise levels in the project vicinity (22nd Street [east of Tennessee Street to east of Illinois Street]; and Illinois Street [20th Street to south of 22nd Street]);
- Combine with cumulative development to cause a substantial permanent increase in ambient noise levels in the project vicinity (22nd Street [east of Tennessee Street to east of Illinois Street] and Illinois Street [20th Street to south of 22nd Street]);
- Generate fugitive dust and criteria air pollutants during construction, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants;
- Result in operational emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants; and
- Combine with past, present, and reasonably foreseeable future development in the project area to contribute to cumulative regional air quality impacts.

Significant project-level impacts are identified in Table S.1: Summary of Impacts of the Proposed Project, with mitigation measures that would reduce impacts to less-than-significant levels.

Table S.1. Summary of Impacts of the Proposed Project

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
Legend: NI = No Impact; LS = Less than Significant; LSM = less than significant with mitigation; S = Significant; SU = Significant and unavoidable impact; SUM = Significant and unavoidable impact with mitigation			
Land Use and Land Use Planning			
LU-1: The Proposed Project would not physically divide an established community.	LS	None required.	LS
LU-2: The Proposed Project would not conflict with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect, such that a substantial adverse physical change in the environment related to Land Use would result.	LS	None required.	LS
C-LU-1: The Proposed Project, in combination with past, present, or reasonably foreseeable future projects, would not contribute considerably to significant cumulative land use impacts related to (a) physical division of an established	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
community, or (b) conflicts with applicable land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.			
Population and Housing			
PH-1: The Proposed Project would not induce substantial population growth in an area, either directly or indirectly.	LS	None required.	LS
PH-2: The Proposed Project would not displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing elsewhere.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-PH-1: The Proposed Project under the Maximum Residential and Maximum Commercial scenarios, in combination with past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable contribution to significant cumulative population and housing impacts.	LS	None required.	LS
Cultural Resources (Archeological Resources)			
CR-1: Construction activities for the Proposed Project would cause a substantial adverse change in the significance of archeological resources, if such resources are present within the project site.	S	**M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting** Based on a reasonable presumption that archeological resources may be present within the project site, the following measures shall be undertaken to avoid any potentially significant adverse effect from the Proposed Project on buried or submerged historical resources. The project sponsors shall retain the services of an archeological consultant from rotational Department Qualified Archeological Consultants List (QACL) maintained by the Planning Department archeologist. The project sponsor shall contact the Department archeologist to obtain the names and contact information for the next three archeological consultants on the QACL. The archeological consultant shall undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required pursuant to this measure. The archeological consultant's work shall be conducted in accordance with this measure at the direction of the Environmental Review Officer (ERO). All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Archeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in State CEQA Guidelines Section 15064.5 (a) and (c). <u>Consultation with Descendant Communities</u> On discovery of an archeological site[11] associated with descendant Native Americans, the Overseas Chinese, or other potentially interested descendant group, an appropriate representative[12] of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archeological field investigations of the site and to consult with the ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the associated archeological site. A copy of the Final Archeological Resources Report shall be provided to the representative of the descendant group. <u>Archeological Testing Program</u> The archeological consultant shall prepare and submit to the ERO for review and approval an archeological testing plan (ATP). The archeological testing program shall be conducted in accordance with the approved ATP. The ATP shall identify the property types of the expected archeological resource(s) that potentially could be adversely affected by the Proposed Project, the testing method to be used, and the locations recommended for testing. The purpose of the archeological testing program will be to determine to the extent possible the presence or absence of archeological resources and to identify and to evaluate whether any archeological resource encountered on the site constitutes an historical resource under CEQA.	

[11] The term "archeological site" is intended here to minimally include any archeological deposit, feature, burial, or evidence of burial.

[12] An "appropriate representative" of the descendant group is here defined to mean, in the case of Native Americans, any individual listed in the current Native American Contact List for the City and County of San Francisco maintained by the California Native American Heritage Commission and in the case of the Overseas Chinese, the Chinese Historical Society of America.

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		At the completion of the archeological testing program, the archeological consultant shall submit a written report of the findings to the ERO. If based on the archeological testing program the archeological consultant finds that significant archeological resources may be present, the ERO in consultation with the archeological consultant shall determine if additional measures are warranted. Additional measures that may be undertaken include additional archeological testing, archeological monitoring, and/or an archeological data recovery program. If the ERO determines that a significant archeological resource is present and that the resource could be adversely affected by the Proposed Project, at the discretion of the project sponsors either: A) The Proposed Project shall be redesigned so as to avoid any adverse effect on the significant archeological resource; or B) A data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible. <u>Archeological Monitoring Program</u> If the ERO in consultation with the archeological consultant determines that an archeological monitoring program (AMP) shall be implemented, the AMP would minimally include the following provisions: • The archeological consultant, project sponsors, and ERO shall meet and consult on the scope of the AMP prior to any project-related soils disturbing activities commencing. The ERO in consultation with the archeological consultant shall determine what project activities shall be archeologically monitored. A single AMP or multiple AMPs may be produced to address project phasing. In most cases, any soils-disturbing activities, such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of piles (foundation, shoring, etc.), site remediation, etc., shall require archeological monitoring because of the risk these activities pose to potential archeological resources and to their depositional context. The	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		archeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archeological resource; • The archeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archeological consultant and the ERO until the ERO has, in consultation with project archeological consultant, determined that project construction activities could have no effects on significant archeological deposits; • The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis; If an intact archeological deposit is encountered, all soils-disturbing activities in the vicinity of the deposit shall cease. The archeological monitor shall be empowered to temporarily redirect demolition/excavation/pile driving/construction activities and equipment until the deposit is evaluated. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, pile driving activity that may affect the archeological resource shall be suspended until an appropriate evaluation of the resource has been made in consultation with the ERO. The archeological consultant shall immediately notify the ERO of the encountered archeological deposit. The archeological consultant shall make a reasonable effort to assess the identity, integrity, and significance of the encountered archeological deposit, and present the findings of this assessment to the ERO. If the ERO determines that a significant archeological resource is present and that the resource could be adversely affected by the Proposed Project, at the discretion of the project sponsors either: A) The Proposed Project shall be redesigned so as to avoid any adverse effect on the significant archeological resource; or	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		B) A data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible. Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO. <u>Archeological Data Recovery Program</u> If the ERO, in consultation with the archeological consultant, determines that an archeological data recovery programs shall be implemented based on the presence of a significant resource, the archeological data recovery program shall be conducted in accord with an archeological data recovery plan (ADRP). No archeological data recovery shall be undertaken without the prior approval of the ERO or the Planning Department archeologist. The archeological consultant, project sponsors, and ERO shall meet and consult on the scope of the ADRP prior to preparation of a draft ADRP. The archeological consultant shall submit a draft ADRP to the ERO. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, shall be limited to the portions of the historical property that could be adversely affected by the Proposed Project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical. The scope of the ADRP shall include the following elements: • *Field Methods and Procedures.* Descriptions of proposed field strategies, procedures, and operations. • *Cataloguing and Laboratory Analysis.* Description of selected cataloguing system and artifact analysis procedures.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		• *Discard and Deaccession Policy.* Description of and rationale for field and post-field discard and deaccession policies. • *Interpretive Program.* Consideration of an on-site/off-site public interpretive program during the course of the archeological data recovery program. • *Security Measures.* Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities. • *Final Report.* Description of proposed report format and distribution of results. • *Curation.* Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities. <u>Human Remains and Associated or Unassociated Funerary Objects</u> The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State and Federal laws. This shall include immediate notification of the coroner of the City and County of San Francisco and in the event of the coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The archeological consultant, project sponsors, ERO, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (State CEQA Guidelines Section 15064.5(d)). The agreement shall take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Final Archeological Resources Report The archeological consultant shall submit a Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the final report. The FARR may be submitted at the conclusion of all construction activities associated with the Proposed Project or on a parcel-by-parcel basis. Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archaeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound, one unbound and one unlocked, searchable PDF copy on CD of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest in or the high interpretive value of the resource, the ERO may require a different final report content, format, and distribution than that presented above. **M-CR-1b: Interpretation** Based on a reasonable presumption that archeological resources may be present within the project site, and to the extent that the potential significance of some such resources is premised on CRHR Criteria 1 (Events), 2 (Persons), and/or 3 (Design/Construction), the following measure shall be undertaken to avoid any potentially significant adverse effect from the Proposed Project on buried or submerged historical resources if significant archeological resources are discovered. The project sponsors shall implement an approved program for interpretation of significant archeological resources. The interpretive program may be combined	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		with the program required under Mitigation Measure M-CR-4b: Public Interpretation. The project sponsors shall retain the services of a qualified archeological consultant from the rotational Department Qualified Archeological Consultants List (QACL) maintained by the Planning Department archeologist having expertise in California urban historical and marine archeology. The archeological consultant shall develop a feasible, resource-specific program for post-recovery interpretation of resources. The particular program for interpretation of artifacts that are encountered within the project site will depend upon the results of the data recovery program and will be the subject of continued discussion between the ERO, consulting archeologist, and the project sponsors. Such a program may include, but is not limited to, any of the following (as outlined in the ARDTP): surface commemoration of the original location of resources; display of resources and associated artifacts (which may offer an underground view to the public); display of interpretive materials such as graphics, photographs, video, models, and public art; and academic and popular publication of the results of the data recovery. The interpretive program shall include an on-site component. The archeological consultant's work shall be conducted at the direction of the ERO, and in consultation with the project sponsors. All plans and recommendations for interpretation by the consultant shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO.	
CR-2: Construction activities for the Proposed Project would cause a substantial adverse change in the significance of human remains, if such resources are present within the project site.	S	Implement **M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting**, above.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
CR-3: Construction activities for the Proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code Section 21074, if such resources are present within the project site.	LS	None required.	LS
C-CR-1: Disturbance of archeological resources, if encountered during construction of the Proposed Project, in combination with other past, present, and future reasonably foreseeable projects, would make a cumulatively considerable contribution to a significant cumulative impact on archeological resources.	S	Implement **Mitigation Measures M-CR-1a and M-CR-1b**, above.	LSM
Cultural Resources (Historic Architectural Resources)			
CR-4: The proposed demolition of contributing buildings would not materially alter, in an adverse manner, the	LS	**Improvement Measure I-CR-4a: Documentation** Before any demolition, rehabilitation, or relocation activities within the UIW Historic District, the project sponsors should retain a professional who meets the Secretary of the Interior's Professional Qualifications Standards for Architectural History to prepare written and photographic documentation of all contributing	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources.		buildings proposed for demolition within the UIW Historic District. The documentation for the property should be prepared based on the National Park Service's Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) Historical Report Guidelines. This type of documentation is based on a combination of both HABS/HAER standards and National Park Service's policy for photographic documentation, as outlined in the NRHP and National Historic Landmarks Survey Photo Policy Expansion. The written historical data for this documentation should follow HABS/HAER standards. The written data should be accompanied by a sketch plan of the property. Efforts should also be made to locate original construction drawings or plans of the property during the period of significance. If located, these drawings should be photographed, reproduced, and included in the dataset. If construction drawings or plans cannot be located, as-built drawings should be produced. Either HABS/HAER-standard large format or digital photography should be used. If digital photography is used, the ink and paper combinations for printing photographs must be in compliance with NR-NHL Photo Policy Expansion and have a permanency rating of approximately 115 years. Digital photographs should be taken as uncompressed, TIFF file format. The size of each image should be 1,600 by 1,200 pixels at 330 pixels per inch or larger, color format, and printed in black and white. The file name for each electronic image should correspond with the index of photographs and photograph label. Photograph views for the dataset should include (a) contextual views; (b) views of each side of each building and interior views, where possible; (c) oblique views of buildings; and (d) detail views of character-defining features, including features on the interiors of some buildings. All views should be referenced on a photographic key. This photographic key should be on a map of the property and should show the photograph number with an arrow to indicate the direction of the view. Historic photographs should also be collected, reproduced, and included in the dataset. The project sponsors should transmit such documentation to the History Room of the San Francisco Public Library, and to the Northwest Information Center of the California Historical Information Resource System. The project sponsors should scope the documentation measures with Planning Department Preservation staff.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Department Preservation staff should also review and approve the submitted documentation for adequacy. **Improvement Measure I-CR-4b: Public Interpretation** Following any demolition, rehabilitation, or relocation activities within the project site, the project sponsors should provide a permanent display(s) of interpretive materials concerning the history and architectural features of the District within publicly accessible areas of the project site. The content of the interpretive display(s) should be coordinated and consistent with the sitewide interpretive plan prepared for the 28-Acre Site in coordination with the Port. The specific location, media, and other characteristics of such interpretive display(s) should be presented to Planning Department preservation planning staff for review and comment and to Port preservation staff for approval prior to any demolition or removal activities.	
CR-5: The proposed rehabilitation of Buildings 2, 12, and 21 would materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources and would materially alter the physical characteristics of Building 21 that justify its individual eligibility for inclusion in the California Register of Historical Resources.	S	**Mitigation Measure M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria.** Prior to Port issuance of building permits associated with Buildings 2, 12 and 21, Port of San Francisco Preservation staff shall review and approve future rehabilitation design proposals for Buildings 2, 12, and 21. Submitted rehabilitation design proposals for Buildings 2 and 12 shall include, in addition to proposed building design, detail on the proposed landscaping treatment within a 20-foot-wide perimeter of each building. The Port's review and analysis would be informed by Historic Resource Evaluation(s) provided by the project sponsors. The Historic Resource Evaluation(s) shall be prepared by a qualified consultant who meets or exceeds the Secretary of the Interior's Professional Qualification Standards in historic architecture or architectural history. The scope of the Historic Resource Evaluation(s) shall be reviewed and approved by Port Preservation and Planning Department Preservation staff prior to the start of work. Following review of the completed Historic Resource Evaluation(s), Planning Department preservation staff would prepare one or more Historic Resource Evaluation Response(s) that would contain the Department's determination as to the effects, if any, on historical resources of the proposed renovation. The Port	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		shall not issue buildings permits associated with Buildings 2, 12, and 21 until Planning Department and Port preservation staff concur that the design (1) conforms with the Secretary of the Interior's Standards for Rehabilitation; (2) is compatible with the UIW Historic District; and (3) preserves the building's historic materials and character-defining features, and repairs instead of replaces deteriorated features, where feasible. Should alternative materials be proposed for replacement of historic materials, they shall be in keeping with the size, scale, color, texture, and general appearance. The performance criteria shall ensure retention of the following character-defining features of each historic building: • **Building 2**: (1) board-formed concrete construction; (2) six-story height; (3) flat roof; (4) rectangular plan and north-south orientation; (5) regular pattern of window openings on east and west elevations; (6) steel, multi-pane, fixed sash windows (floors 1-5); (7) wood sash windows (floor 6); (8) elevator/stair tower that rises above roofline and projects slightly from west façade. • **Building 12**: (1) steel and wood construction; (2) corrugated steel cladding (except the as-built south elevation which was always open to Building 15); (3) 60-foot height; (4) Aiken roof configuration with five raised, glazed monitors; (5) clerestory multi-lite steel sash awning windows along the north and south sides of the monitors; (6) multi-lite, steel sash awning widows, arranged in three bands (with a double-height bottom band) on the north and west elevations, and in four bands on the east elevation; (7) 12-bay configuration of east and west elevations; (8) north-south roof ridge from which roof slopes gently (1/4 inch per foot) to the east and west • **Building 21:** (1) steel frame construction; (2) corrugated metal cladding; (3) double-gable roof clad in corrugated metal, with wide roof monitor at each gable; (4) multi-lite, double hung wood or horizontal steel sash windows[13]; and (5) two pairs of steel freight loading doors on the north elevation, glazed with 12 lites per door.	

[13] Many of the building's windows have been covered with plywood or metal security grates; the monitor windows have been covered with corrugated metal.

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Planning Department staff and Port staff shall not approve any proposal for rehabilitation of Buildings 2, 12, and 21 unless they find that such a scheme conforms to the Secretary's Standards as specified for each building.	
CR-6: The proposed relocation of contributing Building 21 would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources, nor the physical characteristics of Building 21 that justify its eligibility for individual inclusion in the California Register of Historical Resources.	LS	None required.	LS
CR-7: The proposed demolition of non-contributing slipways would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
CR-8: The proposed site grading work associated with contributing Buildings 2 and 12 would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources.	LS	None required.	LS
CR-9: The proposed alteration of Irish Hill, a contributing landscape feature, would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
CR-10: The proposed changes and additions to the network of streets and open space would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources.	LS	None required.	LS
CR-11: The proposed infill construction would materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources.	S	**Mitigation Measure M-CR-11: Performance Criteria and Review Process for New Construction** In addition to the standards and guidelines established as part of the Pier 70 SUD and *Design for Development*, new construction and site development within the Pier 70 SUD shall be compatible with the character of the UIW Historic District and shall maintain and support the District's character-defining features through the following performance criteria (terminology used has definition as provided in the *Design for Development*): 1. New construction shall comply with the Secretary of the Interior's Rehabilitation Standard No. 9: "New Addition, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale and architectural features to protect the integrity of the property and its environment." 2. New construction shall comply with the Infill Development Design Criteria in the Port of San Francisco's *Pier 70 Preferred Master Plan* (2010) as found in Chapter 8, pp 57-69 (a policy document endorsed by the Port Commission to guide staff planning at Pier 70).	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		3. New construction shall be purpose-built structures of varying heights and massing located within close proximity to one another. 4. New construction shall not mimic historic features or architectural details of contributing buildings within the District. New construction may reference, but shall not replicate, historic architectural features or details. 5. New construction shall be contextually appropriate in terms of massing, size, scale, and architectural features, not only with the remaining historic buildings, but with one another. 6. New construction shall reinforce variety through the use of materials, architectural styles, rooflines, building heights, and window types and through a contemporary palette of materials as well as those found within the District. 7. Parcel development shall be limited to the new construction zones identified in *Design for Development* Figure 6.3.1: Allowable New Construction Zones. 8. The maximum height of new construction shall be consistent with the parcel heights identified in *Design for Development* Figure 6.4.1: Building Height Maximum. 9. The use of street trees and landscape materials shall be limited and used judiciously within the Pier 70 SUD. Greater use of trees and landscape materials shall be allowed in designated areas consistent with *Design for Development* Figure 4.7.1: Street Trees and Plantings Plan. 10. New construction shall be permitted adjacent to contributing buildings as identified in *Design for Development* Figure 6.3.2: New Construction Buffers. 11. No substantive exterior additions shall be permitted to contributing Buildings 2, 12, or 21. Building 12 did not historically have a south-facing façade; therefore, rehabilitation will by necessity construct a new south elevation wall. Building 21 shall be relocated approximately 75	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		feet east of its present placement, to maintain the general historic context of the resource in spatial relationship to other resources. Building 21's orientation shall be maintained. Building Specific Standards Each development parcel within the Pier 70 SUD has a different physical proximity and visual relationship to the contributing buildings within the UIW Historic District. For those façades immediately adjacent to or facing contributing buildings, building design shall be responsive to identified character-defining features in the manner described in the *Design for Development* Buildings chapter. All other façades shall have greater freedom in the expression of scale, color, use of material, and overall appearance, and shall be permitted if consistent with Secretary Standard No. 9[14] and the *Design for Development*. Table M.CR.1: Building-Specific Responsiveness, indicates resources that are located adjacent to, and have the greatest influence on the design of, the noted development parcel façade. **Table M.CR.1: Building-Specific Responsiveness** **Façade/Parcel Name-Number** / **Contributing Building (Building No.)** North and West; A — 113 North and Northeast; B — 113, 6 North; C1 — 116 East and South; C2 — 12 South and West; D — 2, 12	

[14] Secretary Standard No. 9 states that "New Addition, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale and architectural features to protect the integrity of the property and its environment."

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation

East and South; E1	21
West; E2	12
West; E4	21
North; F/G	12
East; PKN	113-116

Source: ESA 2015.

Palette of Materials

In addition to the standards and guidelines pertaining to application of materials in the *Design for Development*, the following material performance standards would apply to the building design on the development parcels (terminology used has definition as provided in the *Design for Development*):

- Masonry panels that replicate traditional nineteenth or twentieth century brick masonry patterns shall not be allowed on the east façade of Parcel PKN, north and west façades of Parcel A or on the north façade of Parcel C1.
- Smooth, flat, minimally detailed glass curtain walls shall not be allowed on the façades listed above. Glass with expressed articulation and visual depth or that expresses underlying structure is an allowable material throughout the entirety of the Pier 70 SUD.
- Coarse-sand finished stucco shall not be allowed as a primary material within the entirety of the UIW Historic District.
- Bamboo wood siding shall not be allowed on façades listed above or as a primary façade material.
- Laminated timber panels shall not be allowed on façades listed above.
- When considering material selection immediately adjacent to contributing buildings (e.g., 20th Street Historic Core; Buildings 2, 12, and 21; and Buildings 103, 106, 107, and 108 located within or

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		immediately adjacent to the BAE Systems site), characteristics of compatibility and differentiation shall both be taken into account. Material selection shall not duplicate adjacent building primary materials and treatments, nor shall they establish a false sense of historic development. • Avoid conflict of new materials that appear similar or attempt to replicate historic materials. For example, Building 12 has character-defining corrugated steel cladding. As such, the eastern façade of Parcel C2, the northern façade of Parcels F and G, and the southern façade of Parcel D1 shall not use corrugated steel cladding as a primary material. As another example, Building 113 has character-defining brick-masonry construction. As such, the northern and western façades of Parcel A and the eastern façade of Parcel K North shall not use brick masonry as a primary material. • Use of contemporary materials shall reflect the scale and proportions of historic materials used within the UIW Historic District. • Modern materials shall be designed and detailed in a manner to reflect but not replicate the scale, pattern, and rhythm of adjacent contributing buildings' exterior materials. <u>Review Process</u> Prior to Port issuance of building permits associated with new construction, San Francisco Preservation Planning staff, in consultation with the San Francisco Port Preservation staff, shall use the Final Pier 70 SUD *Design for Development* Standards, including Secretary Standard No. 9, to evaluate all future development proposals within the project site for proposed new construction within the UIW Historic District. As part of this effort, project sponsors shall also submit a written memorandum for review and approval to San Francisco Preservation Planning staff that confirms compliance of all proposed new construction with these guiding plans and policies.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
CR-12: The Proposed Project would not materially alter, in an adverse manner, the physical characteristics of other historical resources (outside of the UIW National Register Historic District) that justify inclusion of such resources in a Federal, State or local register of historical resources.	LS	None required.	LS
C-CR-2: The impacts of the Proposed Project, in consideration of other past, present, and future projects, would materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources, and could materially alter the physical characteristics of Building 21 that justify its individual eligibility for inclusion in the California	S	Implement **Improvement Measure I-CR-4a, Improvement Measure I-CR-4b, Mitigation Measure M-CR-5, and Mitigation Measure M-CR-11**, above.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
Register of Historical Resources.			
C-CR-3: The impacts of the Proposed Project, in consideration of other past, present, and future projects, would not materially alter, in an adverse manner, the physical characteristics of historical resources (outside of the UIW National Register Historic District) that justify its inclusion in the California Register of Historical Resources, resulting in a cumulative impact.	LS	None required.	LS
Transportation and Circulation			
TR-1: Construction of the Proposed Project would not result in significant impacts on the transportation and circulation network because they would be of limited duration and temporary.	LS	**Improvement Measure I-TR-A: Construction Management Plan** Traffic Control Plan for Construction – To reduce potential conflicts between construction activities and pedestrians, bicyclists, transit, and autos during construction activities, the project sponsors should require construction contractor(s) to prepare a traffic control plan for major phases of construction (e.g., demolition and grading, construction, or renovation of individual buildings). The project sponsors and their construction contractor(s) will meet with relevant City agencies to coordinate feasible measures to reduce traffic congestion, including temporary transit stop relocations and other measures to reduce potential traffic and transit disruption and pedestrian circulation effects during major phases of construction. For any work within the public right-of-way, the contractor would be required to comply with San Francisco's Regulations for	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Working in San Francisco Streets (i.e., the "Blue Book"), which establish rules and permit requirements so that construction activities can be done safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicular traffic. Additionally, non-construction-related truck movements and deliveries should be restricted as feasible during peak hours (generally 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., or other times, as determined by SFMTA and the Transportation Advisory Staff Committee [TASC]). In the event that the construction timeframes of the major phases and other development projects adjacent to the project site overlap, the project sponsors should coordinate with City Agencies through the TASC and the adjacent developers to minimize the severity of any disruption to adjacent land uses and transportation facilities from overlapping construction transportation impacts. The project sponsors, in conjunction with the adjacent developer(s), should propose a construction traffic control plan that includes measures to reduce potential construction traffic conflicts, such as coordinated material drop offs, collective worker parking, and transit to job site and other measures. Reduce Single Occupant Vehicle Mode Share for Construction Workers – To minimize parking demand and vehicle trips associated with construction workers, the project sponsors should require the construction contractor to include in the Traffic Control Plan for Construction methods to encourage walking, bicycling, carpooling, and transit access to the project construction sites by construction workers in the coordinated plan. Project Construction Updates for Adjacent Residents and Businesses – To minimize construction impacts on access for nearby residences, institutions, and businesses, the project sponsors should provide nearby residences and adjacent businesses with regularly-updated information regarding construction, including construction activities, peak construction vehicle activities (e.g., concrete pours), travel lane closures, and lane closures via a newsletter and/or website.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
TR-2: The Proposed Project would not cause substantial additional VMT nor substantially induce automobile travel.	LS	None required.	LS
TR-3: The Proposed Project would not create major traffic hazards.	LS	None required.	LS
TR-4: The Proposed Project would not result in any Muni Screenlines exceeding 85 percent capacity utilization nor would it increase ridership by more than five percent on any Muni Screenline forecast to exceed 85 percent capacity utilization under Baseline conditions without the Proposed Project.	LS	None required.	LS
TR-5: The Proposed Project would cause one individual Muni route to exceed 85 percent capacity utilization in the a.m. and p.m. peak hours in both the inbound and outbound directions.	S	**Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed.** Prior to approval of the Proposed Project's phase applications, project sponsors shall demonstrate that the capacity of the 48 Quintara/24th Street bus route has not exceeded 85 percent capacity utilization, and that future demand associated with build-out and occupancy of the phase will not cause the route to exceed its utilization. Forecasts of travel behavior of future phases could be based on trip generation rates forecast in the EIR or based on subsequent surveys of occupants of the project, possibly including surveys conducted as part of ongoing TDM	SUM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		monitoring efforts required as part of Air Quality Mitigation Measure M-AQ-1f: Transportation Demand Management. If trip generation calculations or monitoring surveys demonstrate that a specific phase of the Proposed Project will cause capacity on the 48 Quintara/24th Street route to exceed 85 percent, the project sponsors shall provide capital costs for increased capacity on the route in a manner deemed acceptable by SFMTA through the following means: • The project sponsors shall pay the capital costs for additional buses (up to a maximum of four in the Maximum Residential Scenario and six in the Maximum Commercial Scenario). While the project sponsors could assist with purchasing the buses, SFMTA would need to find funding to pay for the added operating cost associated with operating increased service made possible by the increased vehicle fleet. The source of that funding has not been established. Alternatively, if SFMTA determines that other measures to increase capacity along the route would be more desirable than adding buses, the project sponsors shall pay an amount equivalent to the cost of the required number of buses toward completion of one or more of the following, as determined by SFMTA: • Convert to using higher-capacity vehicles on the 48 Quintara/24th Street route. In this case, the project sponsors shall pay a portion of the capital costs to convert the route to articulated buses. Some bus stops along the route may not currently be configured to accommodate the longer articulated buses. Some bus zones could likely be extended by removing one or more parking spaces; in some locations, appropriate space may not be available. The project sponsors' contribution may not be adequate to facilitate the full conversion of the route to articulated buses; therefore, a source of funding would need to be established to complete the remainder, including improvements to bus stop capacity at all of the bus stops along the route that do not currently accommodate articulated buses.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		• SFMTA may determine that instead of adding more buses to a congested route, it would be more desirable to increase travel speeds along the route. In this case, the project sponsors' contribution would be used to fund a study to identify appropriate and feasible improvements and/or implement a portion of the improvements that would increase travel speeds sufficiently to increase capacity along the bus route such that the project's impacts along the route would be determined to be less than significant. Increased speeds could be accomplished by funding a portion of the planned bus rapid transit system along 16th Street for the 22 Fillmore between Church and Third streets. Adding signals on Pennsylvania Street and 22nd Street may serve to provide increased travel speeds on this relatively short segment of the bus routes. The project sponsors' contribution may not be adequate to fully achieve the capacity increases needed to reduce the project's impacts and SFMTA may need to secure additional sources of funding. • Another option to increase capacity along the corridor is to add new a Muni service route in this area. If this option is selected, project sponsors shall fund purchase of the same number of new vehicles outlined in the first option (four for the Maximum Residential Alternative and six for the Maximum Commercial Alternative) to be operated along the new route. By providing an additional service route, a percentage of the current transit riders on the 48 Quintara/24th Street would likely shift to the new route, lowering the capacity utilization below the 85 percent utilization threshold. As for the first option, funding would need to be secured to pay for operating the new route.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
TR-6: Two individual Muni routes would continue to operate within the 85 percent capacity utilization standard in the a.m. and p.m. peak hours in both the inbound and outbound directions with addition of the Proposed Project.	LS	None required.	LS
TR-7: The Proposed Project would not cause significant impacts on regional transit routes.	LS	None required.	LS
TR-8: Pedestrian travel generated by the Proposed Project could be accommodated on the new roadway and sidewalk network proposed for the project site.	LS	**Improvement Measure I-TR-B: Queue Abatement** It should be the responsibility of the owner/operator of any off-street parking facility with more than 20 parking spaces (excluding loading and car-share spaces) to ensure that vehicle queues do not occur regularly on the public right-of-way. A vehicle queue is defined as one or more vehicles (destined to the parking facility) blocking any portion of any public street, alley, or sidewalk for a consecutive period of 3 minutes or longer on a daily or weekly basis. If a recurring queue occurs, the owner/operator of the parking facility should employ abatement methods as needed to abate the queue. Appropriate abatement methods will vary depending on the characteristics and causes of the recurring queue, as well as the characteristics of the parking facility, the street(s) to which the facility connects, and the associated land uses (if applicable). Suggested abatement methods include but are not limited to the following: redesign of facility to improve vehicle circulation and/or on-site queue capacity; employment of parking attendants; installation of LOT FULL signs with active management by parking attendants; use of valet parking or other space-efficient	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		parking techniques; use of off-site parking facilities or shared parking with nearby uses; use of parking occupancy sensors and signage directing drivers to available spaces; TDM strategies such as additional bicycle parking, customer shuttles, delivery services; and/or parking demand management strategies such as parking time limits, paid parking, time-of-day parking surcharge, or validated parking. If the Planning Director, or his or her designee, suspects that a recurring queue is present, the Planning Department should notify the property owner in writing. Upon request, the owner/operator should hire a qualified transportation consultant to evaluate the conditions at the site for no less than 7 days. The consultant should prepare a monitoring report to be submitted to the Planning Department for review. If the Planning Department determines that a recurring queue does exist, the facility owner/operator should have 90 days from the date of the written determination to abate the queue.	
TR-9: Existing pedestrian facilities in the vicinity of the project site, while incomplete, would not pose substantial hazards to pedestrian traffic generated by the Proposed Project.	LS	None required.	LS
TR-10: Existing pedestrian facilities at the Proposed Project's access points would present barriers to accessible pedestrian travel.	S	**Mitigation Measure M-TR-10: Improve pedestrian facilities on Illinois Street adjacent to and leading to the project site.** As part of construction of the Proposed Project roadway network, the project sponsors shall fund the following improvements: • Install ADA curb ramps on all corners at the intersection of 22nd Street and Illinois Street • Signalize the intersections of Illinois Street with 20th and 22nd Street.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		• Modify the sidewalk on the east side of Illinois Street between 22nd and 20th streets to a minimum of 10 feet. Relocate obstructions, such as fire hydrants and power poles, as feasible, to ensure an accessible path of travel is provided to and from the Proposed Project.	
TR-11: The Proposed Project would not create potentially hazardous conditions for bicyclists and would not interfere with bicycle accessibility to the project site or adjoining areas.	LS	None required.	LS
TR-12: The Proposed Project's loading demand during the peak loading hour would not be adequately accommodated by proposed on-site/off-street loading supply or in proposed on-street loading zones, which may create hazardous conditions or significant delays for transit, bicycles or pedestrians	S	**Mitigation Measure M-TR-12A: Coordinate Deliveries** The Project's Transportation Coordinator shall coordinate with building tenants and delivery services to minimize deliveries during a.m. and p.m. peak periods. Although many deliveries cannot be limited to specific hours, the Transportation Coordinator shall work with tenants to find opportunities to consolidate deliveries and reduce the need for peak period deliveries, where possible. **Mitigation Measure M-TR-12B: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed.** After completion of the first phase of the Proposed Project, and prior to approval of each subsequent phase, the project sponsors shall conduct a study of utilization of on- and off-street commercial loading spaces. The methodology for the study shall be reviewed and approved by the Planning Department prior to completion. If the result of the study indicates that fewer than 15 percent of the commercial loading spaces are available during the peak loading period, the project sponsors shall incorporate measures to convert existing or proposed general purpose on-	SUM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		street parking spaces to commercial parking spaces in addition to the required off-street spaces.	
TR-13: The Proposed Project would not result in significant impacts on emergency access to the project site or adjacent locations.	LS	**Improvement Measure I-TR-C: Strategies to Enhance Transportation Conditions During Events.** The project's Transportation Coordinator should participate as a member of the Mission Bay Ballpark Transportation Coordination Committee (MBBTCC) and provide at least 1-month notification where feasible prior to the start of any then known event that would overlap with an event at AT&T Park. The City and the project sponsors should meet to discuss transportation and scheduling logistics for occasions with multiple events in the area.	LS
C-TR-1: Construction of the Proposed Project would occur over an approximately 11-year time frame and may overlap with construction of other projects in the vicinity.	LS	Implement **Improvement Measure I-TR-A: Construction Management Plan**, above.	LS
C-TR-2: The Proposed Project's incremental effects on regional VMT would not be significant, when viewed in combination with past, present, and reasonably foreseeable future projects.	LS	None required.	LS
C-TR-3: The Proposed Project would not contribute to a major traffic hazard.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-TR-4: The Proposed Project would contribute considerably to significant cumulative transit impacts on the 48 Quintara/24th Street and 22 Fillmore bus routes.	S	**Mitigation Measure M-C-TR-4A: Increase capacity on the 48 Quintara/24th bus route under the Maximum Residential Scenario.** The project sponsors shall contribute funds for one additional vehicle (in addition to and separate from the four prescribed under Mitigation Measure M-TR-5 for the Maximum Residential Scenario) to reduce the Proposed Project's contribution to the significant cumulative impact to not cumulatively considerable. This shall be considered the Proposed Project's fair share toward mitigating this significant cumulative impact. If SFMTA adopts a strategy to increase capacity along this route that does not involve purchasing and operating additional vehicles, the Proposed Project's fair share contribution shall remain the same, and may be used for one of those other strategies deemed desirable by SFMTA. **Mitigation Measure M-C-TR-4B: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario.** The project sponsors shall contribute funds for two additional vehicles to reduce the Proposed Project's contribution to the significant cumulative impact to not considerable. This shall be considered the Proposed Project's fair share toward mitigating this cumulative impact. If SFMTA adopts an alternate strategy to increase capacity along this route that does not involve purchasing and operating additional vehicles, the Proposed Project's fair share contribution shall remain the same, and may be used for one of those other strategies deemed desirable by SFMTA.	SUM
C-TR-5: The Proposed Project would not contribute considerably to a significant cumulative impact on the KT Third Ingleside Muni line.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-TR-6: The Proposed Project would not contribute considerably to significant cumulative impacts at Muni Downtown screenlines.	LS	None required.	LS
C-TR-7: The Proposed Project would not contribute considerably to significant cumulative impacts on regional transit routes.	LS	None required.	LS
C-TR-8: The Proposed Project would not contribute considerably to significant cumulative pedestrian impacts.	LS	None required.	LS
C-TR-9: The Proposed Project would not contribute considerably to a significant cumulative bicycle impact.	LS	None required.	LS
C-TR-10: The Proposed Project would not contribute to a significant cumulative loading impact.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-TR-11: The Proposed Project would not contribute considerably to a significant cumulative impact on emergency vehicle access.	LS	None required.	LS
Noise and Vibration			
NO-1: Construction of the Proposed Project would expose people to or generate noise levels in excess of standards in the Noise Ordinance (Article 29 of the San Francisco Police Code) or applicable standards of other agencies.	S	**Mitigation Measure M-NO-1: Construction Noise Control Plan.** Over the project's approximately 11-year construction duration, project contractors for all construction projects on the Illinois Parcels and 28-Acre Site will be subject to construction-related time-of-day and noise limits specified in Section 2907(a) of the Police Code, as outlined above. Therefore, prior to construction, a Construction Noise Control Plan shall be prepared by the project sponsors and submitted to the Department of Building Inspection. The construction noise control plan shall demonstrate compliance with the Noise Ordinance limits. Noise reduction strategies that could be incorporated into this plan to ensure compliance with ordinance limits may include, but are not limited to, the following: • Require the general contractor to ensure that equipment and trucks used for project construction utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically-attenuating shields or shrouds). • Require the general contractor to locate stationary noise sources (such as compressors) as far from adjacent or nearby sensitive receptors as possible, to muffle such noise sources, and to construct barriers around such sources and/or the construction site, which could reduce construction noise by as much as 5 dBA. To further reduce noise, the contractor shall locate stationary equipment in pit areas or excavated areas, to the maximum extent practicable.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		• Require the general contractor to use impact tools (e.g., jack hammers, pavement breakers, and rock drills) that are hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used, along with external noise jackets on the tools, which would reduce noise levels by as much as 10 dBA. • Include noise control requirements for construction equipment and tools, including concrete saws, in specifications provided to construction contractors to the maximum extent practicable. Such requirements could include, but are not limited to, erecting temporary plywood noise barriers around a construction site, particularly where a site adjoins noise-sensitive uses; utilizing noise control blankets on a building structure as the building is erected to reduce noise levels emanating from the construction site; performing all work in a manner that minimizes noise; using equipment with effective mufflers; undertaking the most noisy activities during times of least disturbance to surrounding residents and occupants; and selecting haul routes that avoid residential uses.[15] • Prior to the issuance of each building permit, along with the submission of construction documents, submit to the Planning Department and Department of Building Inspection or the Port, as appropriate, a plan to track and respond to complaints pertaining to construction noise. The plan shall include the following measures: (1) a procedure and phone numbers for notifying the Department of Building Inspection or the Port,	

[15] Based on FHWA documentation, the following reductions can be achieved: 3-dBA reduction for a noise barrier or other obstruction (like a dirt mound) that interrupts the line-of-sight between the noise source and the receptor; 8-dBA reduction if the noise source is completely enclosed or completely shielded with a solid barrier located close to the source; 5-dBA reduction if the enclosure and/or barrier have some gaps in it; 10-dBA reduction if the noise source is completely enclosed and completely shielded with a solid barrier located close to the source; 15-dBA reduction if a building stands between the noise source and receptor and completely shields the noise source; and 5-dBA reduction if noise source is enclosed or shielded with heavy vinyl noise curtain material (e.g., SoundSeal BBC-13-2 or equivalent).

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		the Department of Public Health, and the Police Department (during regular construction hours and off-hours); (2) a sign posted on-site describing permitted construction days and hours, noise complaint procedures, and a complaint hotline number that shall be answered at all times during construction; (3) designation of an on-site construction complaint and enforcement manager for the project; and (4) notification of neighboring residents and non-residential building managers within 300 feet of the project construction area at least 30 days in advance of extreme noise-generating activities (such as pile driving) about the estimated duration of the activity.	
NO-2: Construction of the Proposed Project would cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	S	**Mitigation Measure M-NO-2: Noise Control Measures During Pile Driving.** The Construction Noise Control Plan (required under Mitigation Measure M-NO-1) shall also outline a set of site-specific noise and vibration attenuation measures for each construction phase when pile driving is proposed to occur. These attenuation measures shall be included wherever impact equipment is proposed to be used on the Illinois Parcels and/or 28-Acre Site. As many of the following control strategies shall be included in the Noise Control Plan, as feasible: • Implement "quiet" pile-driving technology such as pre-drilling piles where feasible to reduce construction-related noise and vibration. • Use pile-driving equipment with state-of-the-art noise shielding and muffling devices. • Use pre-drilled or sonic or vibratory drivers, rather than impact drivers, wherever feasible (including slipways) and where vibration-induced liquefaction would not occur. • Schedule pile-driving activity for times of the day that minimize disturbance to residents as well as commercial uses located on-site and nearby. • Erect temporary plywood or similar solid noise barriers along the boundaries of each Proposed Project parcel as necessary to shield affected sensitive receptors. • Other equivalent technologies that emerge over time.	SUM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
NO-3: Construction of the Proposed Project would expose people and structures to or generate excessive groundborne vibration levels.	S	**Mitigation Measure M-NO-3: Vibration Control Measures During Construction.** As part of the Construction Noise Control Plan required under Mitigation Measure M-NO-1, appropriate vibration controls (including pre-drilling pile holes and using smaller vibratory equipment) shall be specified to ensure that the vibration limit of 0.5 in/sec PPV can be met at adjacent or nearby existing structures and Proposed Project buildings located on the Illinois Parcels and/or 28-Acre Site, except as noted below: • Where pile driving and other construction activities involving the use of heavy equipment would occur in proximity to any contributing building to the Union Iron Works Historic District, the project sponsors shall undertake a monitoring program to minimize damage to adjacent historic buildings and to ensure that any such damage is documented and repaired. The monitoring program, which shall apply within 160 feet where pile driving would be used and within 25 feet of other heavy equipment operation, shall include the following components: o Prior to the start of any ground-disturbing activity, the project sponsors shall engage a historic architect or qualified historic preservation professional to undertake a pre-construction survey of historical resource(s) identified by the San Francisco Planning Department within 160 feet of planned construction to document and photograph the buildings' existing conditions. o Based on the construction and condition of the resource(s), a structural engineer or other qualified entity shall establish a maximum vibration level that shall not be exceeded at each building, based on existing conditions, character-defining features, soils conditions and anticipated construction practices in use at the time (a common standard is 0.2 inch per second, peak particle velocity). o To ensure that vibration levels do not exceed the established standard, a qualified acoustical/vibration consultant shall monitor vibration levels at each structure within 160 feet of planned	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		construction and shall prohibit vibratory construction activities that generate vibration levels in excess of the standard. Should vibration levels be observed in excess of the standard, construction shall be halted and alternative construction techniques put in practice. (For example, pre-drilled piles could be substituted for driven piles, if soil conditions allow; smaller, lighter equipment could possibly also be used in some cases.) The consultant shall conduct regular periodic inspections of each building within 160 feet of planned construction during ground-disturbing activity on the project site. Should damage to a building occur as a result of ground-disturbing activity on the site, the building(s) shall be remediated to its pre-construction condition at the conclusion of ground-disturbing activity on the site. • In areas with a "very high" or "high" susceptibility for vibration-induced liquefaction or differential settlement risks, the project's geotechnical engineer shall specify an appropriate vibration limit based on proposed construction activities and proximity to liquefaction susceptibility zones and modify construction practices to ensure that construction-related vibration does not cause liquefaction hazards at these homes.	
NO-4: Operation of the Proposed Project would result in a substantial permanent increase in ambient noise levels in the immediate project vicinity, or permanently	S	**Mitigation Measure M-NO-4a: Stationary Equipment Noise Controls.** Noise attenuation measures shall be incorporated into all stationary equipment (including HVAC equipment and emergency generators) installed on buildings constructed on the Illinois Parcels and 28-Acre Site as well as into the below-grade or enclosed wastewater pump station as necessary to meet noise limits specified in Section 2909 of the Police Code.[16] Interior noise limits shall be met under both existing and future noise conditions, accounting for foreseeable	LSM

[16] Under Section 2909 of the Police Code, stationary sources are not permitted to result in noise levels that exceed the existing ambient (L_{90}) noise level by more than 5 dBA on residential property, 8 dBA on commercial and industrial property, and 10 dBA on public property. Section 2909(d) states that no fixed noise source may cause the noise level measured inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dBA between 10:00 p.m. and 7:00 a.m. or 55 dBA between 7:00 a.m. and 10:00 p.m. with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
expose persons to noise levels in excess of standards in the San Francisco General Plan and San Francisco Noise Ordinance		changes in noise conditions in the future (i.e., changes in on-site building configurations). Noise attenuation measures could include provision of sound enclosures/barriers, addition of roof parapets to block noise, increasing setback distances from sensitive receptors, provision of louvered vent openings, location of vent openings away from adjacent commercial uses, and restriction of generator testing to the daytime hours. **Mitigation Measure M-NO-4b: Design of Future Noise-Generating Uses near Residential Uses.** Future commercial/office and RALI uses shall be designed to minimize the potential for sleep disturbance at any future adjacent residential uses. Design approaches such as the following could be incorporated into future development plans to minimize the potential for noise conflicts of future uses on the project site: • Design of Future Noise-Generating Commercial/Office and RALI Uses. To reduce potential conflicts between sensitive receptors and new noise-generating commercial or RALI uses located adjacent to these receptors, exterior facilities such as loading areas/docks, trash enclosures, and surface parking lots shall be located on the sides of buildings facing away from existing or planned sensitive receptors (residences or passive open space). If this is not feasible, these types of facilities shall be enclosed or equipped with appropriate noise shielding. • Design of Future Above-Ground Parking Structure. If parking structures are constructed on Parcels C1 or C2, the sides of the parking structures facing adjacent or nearby existing or planned residential uses shall be designed to shield residential receptors from noise associated with parking cars.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
NO-5: Operation of the Proposed Project would cause substantial permanent increases in ambient noise levels along some roadway segments in the project site vicinity.	S	Implement **Mitigation Measure M-AQ-1g** and **Mitigation Measure M-NO-6a**, above and below.	SUM
NO-6: The Proposed Project's occupants would be substantially affected by existing and future noise levels on the site.	S	**Mitigation Measure M-NO-6: Design of Future Noise-Sensitive Uses** Prior to issuance of a building permit for vertical construction of specific residential building design on each parcel, a noise study shall be conducted by a qualified acoustician, who shall determine the need to incorporate noise attenuation measures into the building design in order to meet Title 24's interior noise limit for residential uses as well as the City's (Article 29, Section 2909(d)) 45-dBA (L_{dn}) interior noise limit for residential uses. This evaluation shall account for noise shielding by buildings existing at the time of the proposal, potential increases in ambient noise levels resulting from the removal of buildings that are planned to be demolished, all planned commercial or open space uses in adjacent areas, any known variations in project build-out that have or will occur (building heights, location, and phasing), any changes in activities adjacent to or near the Illinois Parcels or 28-Acre Site (given the Proposed Project's long build-out period), any new shielding benefits provided by surrounding buildings that exist at the time of development, future cumulative traffic noise increases on adjacent roadways, existing and planned stationary sources (i.e., emergency generators, HVAC, etc.), and future noise increases from all known cumulative projects located with direct line-of-sight to the project building. To minimize the potential for sleep disturbance effects from tonal noise or nighttime noise events associated with nearby industrial uses, predicted noise levels at each project building shall account for 24/7 operation of the BAE Systems Ship Repair facility, 24/7 transformer noise at Potrero Substation (if it	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		remains an open air facility), and industrial activities at the AIC, to the extent such use(s) are in operation at the time the analysis is conducted. Noise reduction strategies such as the following could be incorporated into the project design as necessary to meet Title 24 interior limit and minimize the potential for sleep disturbance from adjacent industrial uses: • Orient bedrooms away from major noise sources (i.e., major streets, open space/recreation areas where special events would occur, and existing adjacent industrial uses, including AIC, Potrero Substation, and the BAE site) and/or provide additional enhanced noise insulation features (higher STC ratings) or mechanical ventilation to minimize the effects of maximum instantaneous noise levels generated by these uses even though there is no code requirement to reduce L_{max} noise levels. Such measures shall be implemented on Parcels D and E1 (both scenarios), Building 2 (Maximum Residential Scenario only), Parcels PKN (both scenarios), PKS (both scenarios), and HDY (Maximum Residential Scenario only); • Utilize enhanced exterior wall and roof-ceiling assemblies (with higher STC ratings), including increased insulation; • Utilize windows with higher STC / Outdoor/Indoor Transmission Class (OITC) ratings; • Employ architectural sound barriers as part of courtyards or building open space to maximize building shielding effects, and locate living spaces/bedrooms toward courtyards wherever possible; and • Locate interior hallways (accessing residential units) adjacent to noisy streets or existing/planned industrial or commercial development.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
NO-7: The Proposed Project's special events would result in substantial periodic, temporary noise increases	S	**Mitigation Measure M-NO-7: Noise Control Plan for Special Outdoor Amplified Sound.** The project sponsor shall develop and implement a Noise Control Plan for operations at the proposed entertainment venues to reduce the potential for noise impacts from public address and/or amplified music. This Noise Control Plan shall contain the following elements: • The project sponsor shall comply with noise controls and restrictions in applicable entertainment permit requirements for outdoor concerts. • Speaker systems shall be directed away from the nearest sensitive receptors to the degree feasible. • Outdoor speaker systems shall be operated consistent with the restrictions of Section 2909 of the San Francisco Police Code, and conform to a performance standard of 8 dBA and dBC over existing ambient L90 noise levels at the nearest residential use.	LSM
NO-8: Operation of the Proposed Project would not expose people and structures to or generate excessive groundborne vibration or noise levels.	LS	**None required.**	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-NO-1: Construction of the Proposed Project combined with cumulative construction noise in the project area would not cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction.	LS	**None required.**	LS
C-NO-2: Operation of the Proposed Project, in combination with other cumulative development would cause a substantial permanent increase in ambient noise levels in the project vicinity.	S	Implement **Mitigation Measure M-AQ-1g**, below.	SUM
Air Quality			
AQ-1: During construction, the Proposed Project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively	S	**Mitigation Measure M-AQ-1a: Construction Emissions Minimization** The following mitigation measure is required during construction of Phases 3, 4, and 5, or after build-out of 1.3 million gross square feet of development, whichever comes first: A. *Construction Emissions Minimization Plan.* Prior to issuance of a site permit, the project sponsors shall submit a Construction Emissions Minimization Plan (Plan) to the Environmental Review Officer (ERO) for review and approval by an Environmental Planning Air Quality Specialist. The Plan shall detail project compliance with the following requirements:	SUM

Table S.1 Continued

<table>
<tr><th>Impact</th><th>Level of Significance before Mitigation</th><th>Mitigation and Improvement Measures</th><th>Level of Significance after Mitigation</th></tr>
<tr><td>considerable net increase in criteria air pollutants.</td><td></td><td>1. Where access to alternative sources of power is available, portable diesel generators used during construction shall be prohibited. Where portable diesel engines are required because alternative sources of power are not available, the diesel engine shall meet the EPA or CARB Tier 4 off-road emission standards and be fueled with renewable diesel (at least 99 percent renewable diesel or R99), if commercially available, as defined below.
2. All off-road equipment greater than 25 horsepower that operates for more than 20 total hours over the entire duration of construction activities shall have engines that meet the EPA or CARB Tier 4 off-road emission standards and be fueled with renewable diesel (at least 99 percent renewable diesel or R99), if commercially available. If engines that comply with Tier 4 off-road emission standards are not commercially available, then the project sponsors shall provide the next cleanest piece of off-road equipment as provided by the step-down schedules in Table M-AQ-1-1.
Table M-AQ-1-1: Off-Road Equipment Compliance Step-Down Schedule
<table>
<tr><th>Compliance Alternative</th><th>Engine Emission Standard</th><th>Emissions Control</th></tr>
<tr><td>1</td><td>Tier 3</td><td>CARB PM VDECS (85%)[1]</td></tr>
<tr><td>2</td><td>Tier 2</td><td>CARB PM VDECS (85%)</td></tr>
</table></td><td></td></tr>
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Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		How to use the table: If the requirements of (A)(2) cannot be met, then the project sponsors would need to meet Compliance Alternative 1. Should the project sponsors not be able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 would need to be met. [1] CARB, Currently Verified Diesel Emission Control Strategies (VDECS). Available online at http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm. Accessed January 14, 2016.	
		i. With respect to Tier 4 equipment, "commercially available" shall mean the availability taking into consideration factors such as: (i) critical path timing of construction; and (ii) geographic proximity of equipment to the project site. ii. With respect to renewable diesel, "commercially available" shall mean the availability taking into consideration factors such as: (i) critical path timing of construction; (ii) geographic proximity of fuel source to the project site; and (iii) cost of renewable diesel is within 10 percent of Ultra Low Sulfur Diesel #2 market price. iii. The project sponsors shall maintain records concerning its efforts to comply with this requirement. Should the project sponsor determine either that an off-road vehicle that meets Tier 4 emissions standards or that renewable diesel are not commercially available, the project sponsor shall submit documentation to the satisfaction of the ERO and, for the former condition, shall identify the next cleanest piece of equipment that would be use, in compliance with Table M-AQ-1-1. 3. The project sponsors shall ensure that future developers or their contractors require the idling time for off-road and on-road equipment be limited to no more than 2 minutes, except as provided in exceptions to the applicable State regulations regarding idling for	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		off-road and on-road equipment. Legible and visible signs shall be posted in multiple languages (English, Spanish, and Chinese) in designated queuing areas and at the construction site to remind operators of the 2-minute idling limit. 4. The project sponsors shall require that each construction contractor mandate that construction operators properly maintain and tune equipment in accordance with manufacturer specifications. 5. The Plan shall include best available estimates of the construction timeline by phase with a description of each piece of off-road equipment required for every construction phase and shall be updated pursuant to the reporting requirements in Section B below. Reporting requirements for off-road equipment descriptions and information shall include as much detail as is available, but are not limited to: equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel usage and hours of operation. For Verified Diesel Emission Control Strategies (VDECS) installed, descriptions and information shall include technology type, serial number, make, model, manufacturer, CARB verification number level, and installation date and hour meter reading on installation date. The Plan shall also indicate whether renewable diesel will be used to power the equipment. The Plan shall also include anticipated fuel usage and hours of operation so that emissions can be estimated. 6. The project sponsors and their construction contractors shall keep the Plan available for public review on site during working hours. Each construction contractor shall post at the perimeter of the project site a legible and visible sign summarizing the requirements of the Plan. The sign shall also state that the public may ask to inspect the Plan at any time during working hours, and shall explain how to request inspection of the Plan. Signs shall be posted on all sides of the construction site that face a public right-of-way. The	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		project sponsors shall provide copies of the Plan to members of the public as requested. B. *Reporting.* Quarterly reports shall be submitted to the ERO indicating the construction activities undertaken and information about the off-road equipment used, including the information required in Section A(5). In addition, reporting shall include the approximate amount of renewable diesel fuel used. Within 6 months of the completion of all project construction activities, the project sponsors shall submit to the ERO a final report summarizing construction activities. The final report shall indicate the start and end dates and duration of each construction phase. The final report shall include detailed information required in Section A(5). In addition, reporting shall include the actual amount of renewable diesel fuel used. C. *Certification Statement and On-site Requirements.* Prior to the commencement of construction activities, the project sponsors shall certify through submission of city-standardized forms (1) compliance with the Plan, and (2) all applicable requirements of the Plan have been incorporated into contract specifications. **Mitigation Measure M-AQ-1b: Diesel Backup Generator Specifications** To reduce NOx associated with operation of the Maximum Commercial or Maximum Residential Scenarios, the project sponsors shall implement the following measures. A. All new diesel backup generators shall: 1. have engines that meet or exceed CARB Tier 4 off-road emission standards which have the lowest NOx emissions of commercially available generators; and	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		2. be fueled with renewable diesel, if commercially available, which has been demonstrated to reduce NOx emissions by approximately 10 percent. B. All new diesel backup generators shall have an annual maintenance testing limit of 50 hours, subject to any further restrictions as may be imposed by the BAAQMD in its permitting process. C. For each new diesel backup generator permit submitted to BAAQMD for the project, anticipated location, and engine specifications shall be submitted to the San Francisco Planning Department for review and approval prior to issuance of a permit for the generator from the San Francisco DBI or the Port. Once operational, all diesel backup generators shall be maintained in good working order for the life of the equipment and any future replacement of the diesel backup generators shall be required to be consistent with these emissions specifications. The operator of the facility at which the generator is located shall maintain records of the testing schedule for each diesel backup generator for the life of that diesel backup generator and provide this information for review to the Planning Department within 3 months of requesting such information. **Mitigation Measure M-AQ-1c: Use Low and Super-compliant VOC Architectural Coatings in Maintaining Buildings through** Covenants Conditions and Restrictions (**CC&Rs) and Ground Lease** The Project sponsors shall require all developed parcels to include within their CC&R's and/or ground leases requirements for all future interior spaces to be repainted only with "Super-Compliant" Architectural Coatings (http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings). "Low-VOC" refers to paints that meet the more stringent regulatory limits in South Coast AQMD Rule 1113; however, many manufacturers have reformulated to levels well below these limits. These are referred to as "Super-Compliant" Architectural Coatings.	

Table S.1 Continued

	Mitigation Measure M-AQ-1d: Promote use of Green Consumer Products The project sponsors shall provide education for residential and commercial tenants concerning green consumer products. Prior to receipt of any certificate of final occupancy and every five years thereafter, the project sponsors shall work with the San Francisco Department of Environment (SF Environment) to develop electronic correspondence to be distributed by email annually to residential and/or commercial tenants of each building on the project site that encourages the purchase of consumer products that generate lower than typical VOC emissions. The correspondence shall encourage environmentally preferable purchasing and shall include contact information and links to SF Approved. The website may also be used as an informational resource by businesses and residents. **Mitigation Measure M-AQ-1e: Electrification of Loading Docks** The project sponsors shall ensure that loading docks for retail, light industrial or warehouse uses that will receive deliveries from refrigerated transport trucks incorporate electrification hook-ups for transportation refrigeration units to avoid emissions generated by idling refrigerated transport trucks. **Mitigation Measure M-AQ-1f: Transportation Demand Management.** The project sponsors shall prepare and implement a Transportation Demand Management (TDM) Plan with a goal of reducing estimated one-way vehicle trips by 20 percent compared to the total number of one-way vehicle trips identified in the project's Transportation Impact Study at project build-out. To ensure that this reduction goal could be reasonably achieved, the TDM Plan will have a monitoring goal of reducing by 20 percent the one-way vehicle trips calculated for each building that has received a Certificate of Occupancy and is at least 75% occupied compared to the one-way vehicle trips anticipated for that building based on anticipated development on that parcel, using the trip generation rates contained within the project's Transportation Impact Study. There shall be a Transportation Management Association that would be responsible for the administration, monitoring, and adjustment of the TDM Plan. The project sponsor is responsible for identifying the components of the TDM Plan that could reasonably be expected to achieve the reduction goal for each new building associated with the project, and for making good faith efforts to implement them. The TDM Plan may include, but is not limited to, the types of measures summarized below for explanatory example purposes. Actual TDM measures

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		selected should include those from the TDM Program Standards, which describe the scope and applicability of candidate measures in detail and include: • Active Transportation: Provision of streetscape improvements to encourage walking, secure bicycle parking, shower and locker facilities for cyclists, subsidized bike share memberships for project occupants, bicycle repair and maintenance services, and other bicycle-related services; • Car-Share: Provision of car-share parking spaces and subsidized memberships for project occupants; • Delivery: Provision of amenities and services to support delivery of goods to project occupants; • Family-Oriented Measures: Provision of on-site childcare and other amenities to support the use of sustainable transportation modes by families; • High-Occupancy Vehicles: Provision of carpooling/vanpooling incentives and shuttle bus service; • Information and Communications: Provision of multimodal wayfinding signage, transportation information displays, and tailored transportation marketing services; • Land Use: Provision of on-site affordable housing and healthy food retail services in underserved areas; • Parking: Provision of unbundled parking, short term daily parking provision, parking cash out offers, and reduced off-street parking supply. The TDM Plan shall include specific descriptions of each measure, including the degree of implementation (e.g., for how long will it be in place, how many tenants or visitors will it benefit, on which locations within the site will it be placed, etc.), and the population that each measure is intended to serve (e.g. residential tenants, retail visitors, employees of tenants, visitors, etc.). It shall also include a	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		commitment to monitoring of person and vehicle trips traveling to and from the project site to determine the TDM Plan's effectiveness, as outlined below. The TDM Plan shall be submitted to the City to ensure that components of the TDM Plan intended to meet the reduction target are shown on the plans and/or ready to be implemented upon the issuance of each certificate of occupancy. *TDM Plan Monitoring and Reporting*: The Transportation Management Association, through an on-site Transportation Coordinator, shall collect data and make monitoring reports available for review and approval by the Planning Department staff. • Timing: Monitoring data shall be collected and reports shall be submitted to Planning Department staff every year (referred to as "reporting periods"), until five consecutive reporting periods display the project has met the reduction goal, at which point monitoring data shall be submitted to Planning Department staff once every three years. The first monitoring report is required 18 months after issuance of the First Certificate of Occupancy for buildings that include off-street parking or the establishment of surface parking lots or garages that bring the project's total number of off-street parking spaces to greater than or equal to 500. Each trip count and survey (see below for description) shall be completed within 30 days following the end of the applicable reporting period. Each monitoring report shall be completed within 90 days following the applicable reporting period. The timing shall be modified such that a new monitoring report shall be required 12 months after adjustments are made to the TDM Plan in order to meet the reduction goal, as may be required in the "TDM Plan Adjustments" heading below. In addition, the timing may be modified by the Planning Department as needed to consolidate this requirement with other monitoring and/or reporting requirements for the project. • Components: The monitoring report, including trip counts and surveys, shall include the following components OR comparable alternative	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		methodology and components as approved or provided by Planning Department staff: o Trip Count and Intercept Survey: Trip count and intercept survey of persons and vehicles arriving and leaving the project site for no less than two days of the reporting period between 6:00 a.m. and 8:00 p.m. One day shall be a Tuesday, Wednesday, or Thursday during one week without federally recognized holidays, and another day shall be a Tuesday, Wednesday, or Thursday during another week without federally recognized holidays. The trip count and intercept survey shall be prepared by a qualified transportation or qualified survey consultant and the methodology shall be approved by the Planning Department prior to conducting the components of the trip count and intercept survey. It is anticipated that the Planning Department will have a standard trip count and intercept survey methodology developed and available to project sponsors at the time of data collection. o Travel Demand Information: The above trip count and survey information shall be able to provide travel demand analysis characteristics (work and non-work trip counts, origins and destinations of trips to/from the project site, and modal split information) as outlined in the Planning Department's *Transportation Impact Analysis Guidelines for Environmental Review*, October 2002, or subsequent updates in effect at the time of the survey. o Documentation of Plan Implementation: The TDM Coordinator shall work in conjunction with the Planning Department to develop a survey (online or paper) that can be reasonably completed by the TDM Coordinator and/or TMA staff to document the implementation of TDM program elements and other basic information during the reporting period. This survey shall be included in the monitoring report submitted to Planning Department staff.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		o Assistance and Confidentiality: Planning Department staff will assist the TDM Coordinator on questions regarding the components of the monitoring report and shall ensure that the identity of individual survey responders is protected. *TDM Plan Adjustments.* The TDM Plan shall be adjusted based on the monitoring results if three consecutive reporting periods demonstrate that measures within the TDM Plan are not achieving the reduction goal. The TDM Plan adjustments shall be made in consultation with Planning Department staff and may require refinements to existing measures (e.g., change to subsidies, increased bicycle parking), inclusion of new measures (e.g., a new technology), or removal of existing measures (e.g., measures shown to be ineffective or induce vehicle trips). If three consecutive reporting periods' monitoring results demonstrate that measures within the TDM Plan are not achieving the reduction goal, the TDM Plan adjustments shall occur within 270 days following the last consecutive reporting period. The TDM Plan adjustments shall occur until three consecutive reporting periods' monitoring results demonstrate that the reduction goal is achieved. If the TDM Plan does not achieve the reduction goal then the City shall impose additional measures to reduce vehicle trips as prescribed under the development agreement, which may include restriction of additional off-street parking spaces beyond those previously established on the site, capital or operational improvements intended to reduce vehicle trips from the project, or other measures that support sustainable trip making, until three consecutive reporting periods' monitoring results demonstrate that the reduction goal is achieved. **Mitigation Measure M-AQ-1g: Additional Mobile Source Control Measures** The following Mobile Source Control Measures from the BAAQMD's 2010 Clean Air Plan shall be implemented: • Promote use of clean fuel-efficient vehicles through preferential (designated and proximate to entry) parking and/or installation of charging stations beyond the level required by the City's Green Building code, from 8 to 20 percent.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		• Promote zero-emission vehicles by requesting that any car share program operator include electric vehicles within its car share program to reduce the need to have a vehicle or second vehicle as a part of the TDM program that would be required of all new developments. **Mitigation Measure M-AQ-1h: Offset of Operational Emissions** Prior to issuance of the final certificate of occupancy for the final building associated with Phase 3, or after build out of 1.3 million square feet of development, whichever comes first, the project sponsors, with the oversight of the ERO, shall either: **(1) Directly fund or implement a specific offset project within San Francisco** to achieve reductions of 25 tons per year of ozone precursors and 1 ton of PM_{10}. This offset is intended to offset the estimated annual tonnage of operational ozone precursor and PM_{10} emissions under the buildout scenario realized at the time of completion of Phase 3. To qualify under this mitigation measure, the specific emissions offset project must result in emission reductions within the SFBAAB that would not otherwise be achieved through compliance with existing regulatory requirements. A preferred offset project would be one implemented locally within the City and County of San Francisco. Prior to implementation of the offset project, the project sponsors must obtain the ERO's approval of the proposed offset project by providing documentation of the estimated amount of emissions of ROG, NOx, and PM_{10} to be reduced (tons per year) within the SFBAAB from the emissions reduction project(s). The project sponsors shall notify the ERO within 6 months of completion of the offset project for verification; or **(2) Pay a one-time mitigation offset fee** to the BAAQMD's Strategic Incentives Division in an amount no less than $18,030 per weighted ton of ozone precursors and PM_{10} per year above the significance threshold, calculated as the difference between total annual emissions at build out under mitigated conditions and the significance threshold in the EIR air	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		quality analysis, which is 25 tons per year of ozone precursors and 1 ton of PM_{10}, plus a 5 percent administrative fee, to fund one or more emissions reduction projects within the SFBAAB. This one-time fee is intended to fund emissions reduction projects to offset the estimated annual tonnage of operational ozone precursor and PM_{10} emissions under the buildout scenario realized at the time of completion of Phase 3 or after completion of 1.3 million sf of development, whichever comes first. Documentation of payment shall be provided to the ERO. Acceptance of this fee by the BAAQMD shall serve as an acknowledgment and commitment by the BAAQMD to implement one or more emissions reduction project(s) within 1 year of receipt of the mitigation fee to achieve the emission reduction objectives specified above, and provide documentation to the ERO and to the project sponsors describing the project(s) funded by the mitigation fee, including the amount of emissions of ROG, NOx, and PM_{10} reduced (tons per year) within the SFBAAB from the emissions reduction project(s). If there is any remaining unspent portion of the mitigation offset fee following implementation of the emission reduction project(s), the project sponsors shall be entitled to a refund in that amount from the BAAQMD. To qualify under this mitigation measure, the specific emissions retrofit project must result in emission reductions within the SFBAAB that would not otherwise be achieved through compliance with existing regulatory requirements.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
AQ-2: At project build-out, the Proposed Project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants.	S	Implement **Mitigation Measures M-AQ-1b through M-AQ-1h**, above.	SUM
AQ-3: Construction and operation of the Proposed Project would generate toxic air contaminants, including DPM, which would expose sensitive receptors to substantial pollutant concentrations.	S	Implement **Mitigation Measure M-AQ-1a: Construction Emissions Minimization**, above.	LSM
AQ-4: The Maximum Residential or Maximum Commercial Scenarios would conflict with implementation of the Bay Area 2010 Clean Air Plan.	S	Implement **Mitigation Measure M-AQ-1f and Mitigation Measure M-AQ-1g**, above.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
AQ-5: The Maximum Residential or Maximum Commercial Scenarios would not create objectionable odors that would affect a substantial number of people	LS	None required.	LS
C-AQ-1: The Maximum Residential or Maximum Commercial Scenarios, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative regional air quality impacts.	S	Implement **Mitigation Measures M-AQ-1a through M-AQ-1h**, above.	SUM
C-AQ-2: The Maximum Residential or Maximum Commercial Scenarios, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative health risk impacts on sensitive receptors.	S	Implement **Mitigation Measures M-AQ-1a and M-AQ-1b**, above.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
Greenhouse Gas Emissions			
C-GG-1: The Proposed Project would generate GHG emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions.	LS	None required.	LS
Wind and Shadow			
WS-1: The phased development of the Proposed Project would temporarily alter wind in a manner that substantially affects public areas.	S	**Mitigation Measure M-WS-1: Identification and Mitigation of Interim Hazardous Wind Impacts** When the circumstances or conditions listed in Table M.WS.1 are present at the time a building Schematic Design is submitted, the requirements described below apply: **Table M.WS.1: Circumstances or Conditions during which Mitigation Measure M-WS-1 Applies** **Subject Parcel Proposed for Construction** / **Circumstance or Condition** / **Related Upwind Parcels** Parcel A / Construction of any new buildings on Parcel A. / NA Parcel B / Construction of any new buildings on Parcel B. / NA	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures			Level of Significance after Mitigation
		Parcel E2	Construction of any new buildings on Parcel E2 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels H1 and G that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels H1 and G	
		Parcel E3	Construction of any new buildings on Parcel E3 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels E2 and G that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels E2 and G	
		Parcel F	Construction of any new buildings on Parcel F.	NA	
		Parcel G	Construction of any new buildings on Parcel G.	NA	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures			Level of Significance after Mitigation
		Parcel H1	Construction of any new buildings on Parcel H1 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels E2 and G that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels E2 and G	
		Parcel H2	Construction of any new buildings on Parcel H2 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels H1, E2, and E3 that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels H1, E2, and E3	

Source: SWCA.

Requirements

A wind impact analysis shall be required prior to building permit issuance for any proposed new building that is located within the project site and meets the conditions described above. All feasible means (e.g., changes in design, relocating or reorienting certain building(s), sculpting to include podiums and roof terraces, adding architectural canopies or screens, or street furniture) to eliminate hazardous winds, if predicted, shall be implemented. After such design changes

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		and features have been considered, the additional effectiveness of landscaping may also be considered. 1. Screening-level analysis. A qualified wind consultant approved by the Planning Department's Environmental Review Officer (ERO) shall review the proposed building design and conduct a "desktop review" in order to provide a qualitative result determining whether there could be a wind hazard. The screening-level analysis shall have the following steps: For each new building proposed that meets the criteria above, a qualified wind consultant shall review and compare the exposure, massing, and orientation of the proposed building(s) on the subject parcel to the building(s) on the same parcel in the representative massing models of the Proposed Project tested in the wind tunnel as part of this EIR and in any subsequent wind analysis testing required by this mitigation measure. The wind consultant shall identify and compare the potential impacts of the proposed building(s) to those identified in this EIR, subsequent wind testing that may have occurred under this mitigation measure, and to the City's wind hazard criterion. The wind consultant's analysis and evaluation shall consider the proposed building(s) in the context of the "Current Project Baseline," which, at any given time during construction of the Proposed Project, shall be defined as any existing buildings at the site, the as-built designs of all previously-completed structures and the then-current designs of approved but yet unbuilt structures that would be completed by the time of occupancy of the subject building. (a) If the qualified wind consultant concludes that the building design(s) could not create a new wind hazard and could not contribute to a wind hazard identified by prior wind tunnel testing for the EIR and in subsequent wind analysis required by this mitigation measure, no further review would be required. If there could be a new wind hazard, then a quantitative assessment shall be conducted using wind tunnel testing or an equivalent quantitative analysis that produces comparable results to the analysis methodology used in this EIR.	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		(b) If the qualified wind consultant concludes that the building design(s) could create a new wind hazard or could contribute to a wind hazard identified by prior wind tunnel testing conducted for this EIR and in subsequent wind analysis required by this mitigation measure, but in the consultant's professional judgment the building(s) can be modified to reduce such impact to a less-than-significant level, the consultant shall notify the ERO and the building applicant. The consultant's professional judgment may be informed by the use of "desktop" analytical tools, such as computer tools relying on results of prior wind tunnel testing for the Proposed Project and other projects (i.e., "desktop" analysis does not include new wind tunnel testing). The analysis shall include consideration of wind location, duration, and speed of wind. The building applicant may then propose changes or supplements to the design of the proposed building(s) to achieve this result. These changes or supplements may include, but are not limited to, changes in design, building orientation, sculpting to include podiums and roof terraces, and/or the addition of architectural canopies or screens, or street furniture. The effectiveness of landscaping may also be considered. The wind consultant shall then reevaluate the building design(s) with specified changes or supplements. If the wind consultant demonstrates to the satisfaction of the ERO that the modified design and landscaping for the building(s) could not create a new wind hazard or contribute to a wind hazard identified in prior wind tunnel testing conducted for this EIR and in subsequent wind analysis required by this mitigation measure, no further review would be required. (c) If the consultant is unable to demonstrate to the satisfaction of the ERO that no increase in wind hazards would occur, wind tunnel testing or an equivalent method of quantitative evaluation producing results that can be compared to those used in the EIR and in any subsequent wind analysis testing required by this mitigation measure is required. The building(s) shall be wind tunnel tested in the	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		context of a model that represents the Current Project Baseline, as described in Item 1, above. The testing shall include all the test points in the vicinity of a proposed building or group of buildings that were tested in this EIR, as well as all additional points deemed appropriate by the consultant to determine the wind performance for the building(s). Testing shall occur in places identified as important, e.g., building entrances, sidewalks, etc., and there may need to be additional test point locations considered. At the direction and approval of the Planning Department, the "vicinity" shall be determined by the wind consultant, as appropriate for the circumstances, e.g., a starting concept for "vicinity" could be approximately 350 feet around the perimeter of the subject parcel(s), subject to the wind consultant's reducing or increasing this radial distance. The wind tunnel testing shall test the proposed building design(s), as well as the Current Project Baseline, in order to clearly identify those differences that would be due to the proposed new building(s). In the event the wind tunnel testing determines that design of the building(s) would increase the hours of wind hazard or extent of area subject to hazardous winds beyond those identified in prior wind testing conducted for this EIR and in subsequent wind tunnel analysis required by this mitigation measure, the wind consultant shall notify the ERO and the building applicant. The building applicant may then propose changes or supplements to the design of the proposed building(s) to eliminate wind hazards. These changes or supplements may include, but are not limited to, changes in design, building orientation, sculpting building(s) to include podiums and roof terraces, adding architectural canopies or screens, or street furniture. All feasible means (changes in design, relocating or reorienting certain building(s), sculpting to include podiums and roof terraces, the addition of architectural canopies or screens, or street furniture) to eliminate wind hazards, if predicted, shall be implemented to the extent necessary to mitigate the impact. After such design changes and features have been considered, the	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		additional effectiveness of landscaping at the size it is proposed to be installed may also be considered. The wind consultant shall then reevaluate the building design(s) with specified changes or supplements. If the wind consultant demonstrates to the satisfaction of the ERO that the modified design would not create a new wind hazard or contribute to a wind hazard identified in prior wind tunnel testing conducted for this EIR and in subsequent wind analysis required by this mitigation measure, no further review would be required. If the proposed building(s) would result in a wind hazard exceedance, and the only way to eliminate the hazard is to redesign a proposed building, then the building shall be redesigned.	
WS-2: For public open space built on rooftops, the Proposed Project would alter wind in a manner that affects those public open spaces.	S	**Mitigation Measure M-WS-2: Wind Reduction for Rooftop Winds** If the rooftop of building(s) is proposed as public open space and/or a passive or active public recreational area prior to issuance of a building permit for the subject building(s), a qualified wind consultant shall prepare a wind impact and mitigation analysis in the context of the Current Project Baseline regarding the proposed architectural design. All feasible means (such as changing the proposed building mass or design; raising the height of the parapets to at least 8 feet, using a porous material where such material would be effective in reducing wind speeds; using localized wind screens, canopies, trellises, and/or landscaping around seating areas) to eliminate wind hazards shall be implemented as necessary. A significant wind impact would be an increase in the number of hours that the wind hazard criterion is exceeded or an increase in the area subjected to winds exceeding the hazard criterion as compared to existing conditions at the height of the proposed rooftop. The wind consultant shall demonstrate to the satisfaction of the ERO that the building design would not create a new wind hazard or contribute to a wind hazard identified in prior wind testing conducted for this EIR.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
WS-3: At full build-out, the Proposed Project would not alter wind in a manner that substantially affects ground-level public areas.	LS	**Improvement Measure I-WS-3a: Wind Reduction for Public Open Spaces and Pedestrian and Bicycle Areas** For each development phase, a qualified wind consultant should prepare a wind impact and mitigation analysis regarding the proposed design of public open spaces and the surrounding proposed buildings. Feasible means should be considered to improve wind comfort conditions for each public open space, particularly for any public seating areas. These feasible means include horizontal and vertical, partially-porous wind screens (including canopies, trellises, umbrellas, and walls), street furniture, landscaping, and trees. Specifics for particular public open spaces are set forth in Improvement Measures I-WS-3b to I-WS-3f. Any proposed wind-related improvement measure should be consistent with the design standards and guidelines outlined in the *Pier 70 SUD Design for Development*. **Improvement Measure I-WS-3b: Wind Reduction for Waterfront Promenade and Waterfront Terrace** The Waterfront Promenade and Waterfront Terrace would be subject to winds exceeding the pedestrian wind comfort criteria. A qualified wind consultant should prepare written recommendations of feasible means to improve wind comfort conditions in this open space, emphasizing vertical elements, such as wind screens and landscaping. Where necessary and appropriate, wind screens should be strategically placed directly around seating areas. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous material. Design of any wind screen or landscaping shall be compatible with the Historic District. **Improvement Measure I-WS-3c: Wind Reduction for Slipways Commons** The central and western portions of Slipways Commons would be subject to winds exceeding the pedestrian wind comfort criteria. Street trees should be considered along Maryland Street, particularly on the east side of Maryland Street between Buildings E1 and E2. Vertical elements such as wind screens would help	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		for areas where street trees are not feasible. Where necessary and appropriate, wind screens should be strategically placed to the west of any seating areas. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous material. Design of any wind screen or landscaping shall be compatible with the Historic District. **Improvement Measure I-WS-3d: Wind Reduction for Building 12 Market Plaza and Market Square** Building 12 Market Plaza and Market Square would be subject to winds exceeding the pedestrian wind comfort criteria. For reducing wind speeds in the public courtyard between Buildings 2 and 12, the inner south and west façades of Building D-1 could be stepped by at least 12 feet to direct downwashing winds above pedestrian level. Alternatively, overhead protection should be used, such as a 12-foot-deep canopy along the inside south and west façades of Building D-1, or localized trellises or umbrellas over seating areas. For reducing wind speeds on the eastern and southern sides of Building 12, street trees should be considered, along Maryland and 22nd streets. Smaller underplantings should be combined with street trees to reduce winds at pedestrian level. Design of any wind screen or landscaping shall be compatible with the Historic District. **Improvement Measure I-WS-3e: Wind Reduction for Irish Hill Playground** The Irish Hill Playground would be subject to winds exceeding the pedestrian wind comfort criteria. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous material. Design of any wind screen or landscaping shall be compatible with the Historic District. **Improvement Measure I-WS-3f: Wind Reduction for 20th Street Plaza** The 20th Street Plaza would be subject to winds exceeding the pedestrian wind comfort criteria. A qualified wind consultant should prepare written recommendations of feasible means to improve wind comfort conditions in this open space, emphasizing hardscape elements, such as wind screens, canopies, and umbrellas. Where necessary and appropriate, wind screens should be strategically placed to the northwest of any seating area. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		material. If there would be seating areas directly adjacent to the north façade of the PKN Building, localized canopies or umbrellas should be used. Design of any wind screen or landscaping shall be compatible with the Historic District.	
C-WS-1: The Proposed Project at full build-out, when combined with other cumulative projects, would not alter wind in a manner that substantially affects public areas within the vicinity of the project site.	LS	None required.	LS
WS-4: The Proposed Project would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas.	LS	None required.	LS
C-WS-2: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects in the project vicinity, would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas. The Proposed Project would not make a cumulatively considerable	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
contribution to a significant cumulative shadow impact.			
Recreation			
RE-1: The Proposed Project would increase the use of existing neighborhood and regional parks or other recreational facilities, but not to such an extent that substantial physical deterioration of existing facilities would occur or be accelerated, or such that the construction of new facilities would be required.	LS	None required.	LS
RE-2: Construction of the parks and recreational facilities proposed as part of the Proposed Project would not result in substantial adverse physical environmental impacts beyond those analyzed and disclosed in this EIR.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-RE-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a cumulatively considerable contribution to significant cumulative impacts on recreation.	LS	None required.	LS
Utilities and Service Systems			
UT-1: The City's water service provider would have sufficient water supply available to serve the Proposed Project from existing entitlements and resources, and would not require new or expanded water supply resources or entitlements.	LS	None required.	LS
UT-2: The Proposed Project would not require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
UT-3: The Proposed Project would not exceed wastewater treatment requirements of the Southeast Water Pollution Control Plant.	LS	None required.	LS
UT-4: The Proposed Project would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Nor would the project result in a determination by the SFPUC that it has inadequate capacity to serve the project's projected demand in addition to its existing commitments.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
UT-5: The Proposed Project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	LS	None required.	LS
UT-6: The Proposed Project would be served by a landfill with sufficient capacity to accommodate the Proposed Project's solid waste disposal needs.	LS	None required.	LS
UT-7: The Proposed Project would not fail to comply with Federal, State, and local statutes and regulations related to solid waste.	NI	None required.	NI

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-UT-1: The Proposed Project, in combination with other past, present, and reasonably foreseeable future projects, would not result in significant adverse cumulative utilities and service systems impacts.	LS	None required.	LS
Public Services			
PS-1: The Proposed Project would not result in the need for new or physically altered facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police protection.	LS	None required.	LS
PS-2: The Proposed Project would not result in the need for new or physically altered facilities in order to maintain acceptable response times for fire protection and emergency medical services.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
PS-3: The increase in students associated with implementation of the Proposed Project would not require new or expanded school facilities, the construction of which could result in substantial adverse impacts.	LS	None required.	LS
PS-4: The Proposed Project would not result in an increase in demand for library services that could not be met by existing library facilities.	LS	None required.	LS
C-PS-1: The Proposed Project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable contribution to significant adverse cumulative impacts that would result in a need for construction of new or physically altered facilities in order to maintain acceptable service ratios, response	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
times, or other performance objectives for any public services, including police protection, fire protection and emergency services, schools, and libraries.			
Biological Resources			
BI-1: Construction and operation of the Proposed Project would have a substantial adverse effect either directly or through habitat modifications on migratory birds and/or on bird species identified as special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	S	**Mitigation Measure M-BI-1: Worker Environmental Awareness Program Training** Project-specific Worker Environmental Awareness Program (WEAP) training shall be developed and implemented by a qualified biologist and attended by all project personnel performing demolition or ground-disturbing work prior to beginning demolition or ground-disturbing work on site. The WEAP training shall generally include, but not be limited to, education about the following: a. Applicable State and Federal laws, environmental regulations, project permit conditions, and penalties for non-compliance. b. Special-status plant and animal species with the potential to be encountered on or in the vicinity of the project site during construction. c. Avoidance measures and a protocol for encountering special-status species including a communication chain. d. Preconstruction surveys and biological monitoring requirements associated with each phase of work and at specific locations within the project site (e.g., shoreline work) as biological resources and protection measures will vary depending on where work is occurring within the site, time of year, and construction activity. e. Known sensitive resource areas in the project vicinity that are to be avoided and/or protected as well as approved project work areas, access roads, and staging areas.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		f. Best management practices (BMPs) (e.g., straw wattles or spill kits) and their location around the project site for erosion control and species exclusion, in addition to general housekeeping requirements.	
BI-2: Construction of the Proposed Project would have a substantial adverse effect either directly or through habitat modifications on bats identified as special-status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the United States Fish and Wildlife Service.	S	**Mitigation Measure M-BI-2: Avoidance and Minimization Measures for Bats** A qualified biologist (as defined by CDFW[17]) who is experienced with bat surveying techniques (including auditory sampling methods), behavior, roosting habitat, and identification of local bat species shall be consulted prior to demolition or building relocation activities to conduct a pre-construction habitat assessment of the project site (focusing on buildings to be demolished or relocated) to characterize potential bat habitat and identify potentially active roost sites. No further action is required should the pre-construction habitat assessment not identify bat habitat or signs of potentially active bat roosts within the project site (e.g., guano, urine staining, dead bats, etc.). The following measures shall be implemented should potential roosting habitat or potentially active bat roosts be identified during the habitat assessment in buildings to be demolished or relocated under the Proposed Project or in trees adjacent to construction activities that could be trimmed or removed under the Proposed Project: a) In areas identified as potential roosting habitat during the habitat assessment, initial building demolition, relocation, and any tree work (trimming or removal) shall occur when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15, to the extent feasible. These dates avoid the bat maternity roosting season and period of winter torpor.[18]	LSM

[17] CDFW defines credentials of a "qualified biologist" within permits or authorizations issued for a project. Typical qualifications include a minimum of five years of academic training and professional experience in biological sciences and related resource management activities, and a minimum of two years of experience conducting surveys for each species that may be present within the project area.

[18] Torpor refers to a state of decreased physiological activity with reduced body temperature and metabolic rate.

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		b) Depending on temporal guidance as defined below, the qualified biologist shall conduct pre-construction surveys of potential bat roost sites identified during the initial habitat assessment no more than 14 days prior to building demolition or relocation, or any tree trimming or removal. c) If active bat roosts or evidence of roosting is identified during pre-construction surveys, the qualified biologist shall determine, if possible, the type of roost and species. A no-disturbance buffer shall be established around roost sites until the qualified biologist determines they are no longer active. The size of the no-disturbance buffer would be determined by the qualified biologist and would depend on the species present, roost type, existing screening around the roost site (such as dense vegetation or a building), as well as the type of construction activity that would occur around the roost site. If special-status bat species or maternity or hibernation roosts are detected during these surveys, appropriate species- and roost-specific avoidance and protection measures shall be developed by the qualified biologist in coordination with CDFW. Such measures may include postponing the removal of buildings or structures, establishing exclusionary work buffers while the roost is active (e.g., 100-foot no-disturbance buffer), or other compensatory mitigation. d) The qualified biologist shall be present during building demolition, relocation, or tree work if potential bat roosting habitat or active bat roosts are present. Buildings and trees with active roosts shall be disturbed only under clear weather conditions when precipitation is not forecast for three days and when daytime temperatures are at least 50 degrees Fahrenheit. e) The demolition or relocation of buildings containing or suspected to contain bat roosting habitat or active bat roosts shall be done under the supervision of the qualified biologist. When appropriate, buildings shall be partially dismantled to significantly change the roost conditions,	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		causing bats to abandon and not return to the roost, likely in the evening and after bats have emerged from the roost to forage. Under no circumstances shall active maternity roosts be disturbed until the roost disbands at the completion of the maternity roosting season or otherwise becomes inactive, as determined by the qualified biologist. f) Trimming or removal of existing trees with potential bat roosting habitat or active (non-maternity or hibernation) bat roost sites shall follow a two-step removal process (which shall occur during the time of year when bats are active, according to a) above, and depending on the type of roost and species present, according to c) above). i. On the first day and under supervision of the qualified biologist, tree branches and limbs not containing cavities or fissures in which bats could roost shall be cut using chainsaws. ii. On the following day and under the supervision of the qualified biologist, the remainder of the tree may be trimmed or removed, either using chainsaws or other equipment (e.g., excavator or backhoe). iii. All felled trees shall remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any bats to escape, or be inspected once felled by the qualified biologist to ensure no bats remain within the tree and/or branches.	
BI-3: Construction of the Proposed Project would have a substantial adverse effect, either directly or through habitat modifications, on aquatic species identified as candidate, sensitive, or special-status species in	S	**Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals** Prior to the start of reconstruction of the bulkhead in Reach II, the project sponsors shall prepare a detailed Construction Plan that outlines the details of the piling installation approach. This Plan shall be reviewed and approved by the City of San Francisco or other designated City, State, or Federal agency, as determined by the San Francisco Planning Department. The information provided in this plan shall include, but not be limited to, the following:	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
local, regional, or Federal plans, policies, or regulations, or by California Department of Fish and Wildlife, United States Fish and Wildlife Service, or National Oceanic and Atmospheric Administration.		• The type of piling to be used (whether sheet pile or H-pile); • The piling size to be used; • The method of pile installation to be used; • Noise levels for the type of piling to be used and the method of pile driving; • Recalculation of potential underwater noise levels that could be generated during pile driving using methodologies outlined in CalTrans 2009;[19] and • When pile driving is to occur. If the results of the recalculations provided in the detailed Construction Plan for pile driving discussed above indicate that underwater noise levels are less than 183 dB (SEL) for fish at a distance of 33 feet (less than or equal to 10 meters) and 160 dB (RMS) sound pressure level or 120 dB (RMS) re 1 μPa impulse noise level for marine mammals for a distance 1,640 feet (500 meters), then no further measures are required to mitigate underwater noise. If recalculated noise levels are greater than those identified above, then the project sponsors shall develop a sound attenuation reduction and monitoring plan. This plan shall be reviewed and approved by the Planning Department Environmental Review Officer or other City-designated person. This plan shall provide detail on the sound attenuation system, detail methods used to monitor and verify sound levels during pile-driving activities, and all BMPs to be taken to reduce impact hammer pile-driving sound in the marine environment to an intensity level of less than 183 and 160/120 dB (as identified above) at distances of 33 feet (less than or equal to 10 meters) for fish and 1,640 feet (500 meters) for marine mammals. The sound-monitoring results shall be made available to NOAA Fisheries. If, in the case of marine mammals, recalculated noise levels are greater than 160 dB (peak) at less than or equal to 1,640 feet (500 meters), then the project sponsors shall consult with NOAA to determine the need to obtain an Incidental Harassment	

[19] Caltrans, Technical Guidance for Assessment and Mitigation.

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Authorization (IHA) under the MMPA. If an IHA is required by NOAA, an application for an IHA shall be prepared by the project sponsor. The plan shall incorporate as appropriate, but not be limited to, the following BMPs: • Any impact-hammer-installed soldier wall H-pilings or sheet piling shall be conducted in strict accordance with the Long-Term Management Strategy (LTMS) work windows for Pacific herring,[20] during which the presence of Pacific herring in the project site is expected to be minimal unless, where applicable, NOAA Fisheries in their Section 7 consultation with the Corps determines that the potential effect to special-status fish species is less than significant. • If pile installation using impact hammers must occur at times other than the approved LTMS work window for Pacific herring or result in underwater sound levels greater than those identified above, the project sponsors shall consult with both NOAA Fisheries and CDFW on the need to obtain incidental take authorizations to address potential impacts to longfin smelt and green sturgeon associated with reconstruction of the steel sheet pile bulkhead in Reach II, and to implement all requested actions to avoid impacts. • A 1,640-foot (500-meter) safety zone shall be established and maintained around the sound source to the extent such a safety zone is located within in-water areas, for the protection of marine mammals in the event that sound levels are unknown or cannot be adequately predicted. • In-water work activities associated with reconstruction of the steel sheet pile bulkhead in Reach II shall be halted when a marine mammal enters the 1,640-foot (500-meter) safety zone and shall cease until the mammal has been gone from the area for a minimum of 15 minutes.	

[20] U.S. Army Corps of Engineers, Programmatic Essential Fish Habitat (EFH) Assessment for the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region. July 2009.

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		• A "soft start" technique shall be used in all pile driving, giving marine mammals an opportunity to vacate the area. • A NOAA Fisheries-approved biological monitor shall conduct daily surveys before and during impact hammer pile driving to inspect the safety zone and adjacent San Francisco Bay waters for marine mammals. The monitor shall be present as specified by NOAA Fisheries during the impact pile-driving phases of construction. • Other BMPs shall be implemented as necessary, such as using bubble curtains or an air barrier, to reduce underwater noise levels to acceptable levels. Alternatively, the project sponsors may consult with NOAA directly and submit evidence to their satisfaction of the Environmental Review Officer of NOAA consultation. In such case, the project sponsors shall comply with NOAA recommendations and/or requirements.	
BI-4: The Proposed Project would have a substantial adverse effect on Federally-protected waters as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.	S	**Mitigation Measure M-BI-4: Compensation for Fill of Jurisdictional Waters** To offset temporary and/or permanent impacts to jurisdictional waters of San Francisco Bay adjacent to the 28-Acre Site, construction associated with repair or replacement of the Reach II bulkhead shall be conducted as required by regulatory permits (i.e., those issued by the Corps, RWQCB, and BCDC) and in coordination with NMFS as appropriate. If required by regulatory permits, compensatory mitigation shall be provided as necessary, at a minimum ratio of 1:1 for fill beyond that required for normal repair and maintenance of existing structures. Compensation may include on-site or off-site shoreline improvements or intertidal/subtidal habitat enhancements along San Francisco's eastern waterfront through removal of chemically treated wood material (e.g., pilings, decking, etc.) by pulling, cutting, or breaking off piles at least 1 foot below mudline or removal of other unengineered debris (e.g., concrete-filled drums or large pieces of concrete).	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Improvements would be implemented in accordance with NMFS as appropriate. On-site or off-site restoration/enhancement plans, if required, must be prepared by a qualified biologist prior to construction and approved by the permitting agencies prior to beginning construction, repair, or replacement of the Reach II bulkhead. Implementation of restoration/enhancement activities by the permittee shall occur prior to project impacts, whenever possible.	
BI-5: The Proposed Project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	S	Implement **Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals,** above.	LSM
BI-6: The Proposed Project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and would not have a substantial conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-BI-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would result in a cumulatively considerable contribution to significant biological resources impacts.	S	Implement **Mitigation Measures M-BI-1: Worker Environmental Awareness Program Training, M-BI-2: Avoidance and Minimization Measures for Bats, Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals,** and **Mitigation Measure M-BI-4: Compensation for Fill of Jurisdictional Waters**, above.	LSM
Geology and Soils			
GE-1: The Proposed Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, seismic ground shaking, seismically induced ground failure, or seismically induced landslides.	LS	None required.	LS
GE-2: The Proposed Project would not result in substantial erosion or loss of topsoil.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
GE-3: The project site would not be located on a geologic unit or soil that is unstable, or that could become unstable as a result of the Proposed Project.	S	**Mitigation Measure M-GE-3a: Reduction of Rock Fall Hazards** The project sponsors shall prepare a site-specific geotechnical report(s), subject to review and approval by the Port, that evaluates the design and construction methods proposed for Parcels PKS, C-1, and C-2, the Irish Hill playground, and 21st Street. The investigations shall determine the potential for rock fall hazards. If the potential for rock fall hazards is identified, the site-specific geotechnical investigations shall identify measures to minimize such hazards to be implemented by the project sponsors. Possible measures to reduce the impacts of potential rock fall hazards include, but are not limited to, the following: • Limited regrading to adjust slopes to stable gradient; • Rock fall containment measures such as installation of drape nets, rock fall catchment fences, or diversion dams; and • Site design measures such as implementing setbacks to ensure that buildings and public uses are outside areas that could be subject to damage as a result of rock fall. **Mitigation Measure M-GE-3b: Signage and Restricted Access to Pier 70** Prior to issuance of the first certificate of occupancy under the Proposed Project, the project sponsors shall install a gate or an equivalent measure to prevent access to the existing dilapidated pier at the project site. A sign shall be posted at the potential access point informing the public of potential risks associated with use of the structure and prohibiting public access.	LSM
GE-4: The Proposed Project would not create substantial risks to life or property as a result of locating buildings or other features on expansive or corrosive soils.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
GE-5: The Proposed Project would not substantially change the topography or any unique geologic or physical features of the site.	LS	None required.	LS
GE-6: The Proposed Project would directly or indirectly destroy a unique paleontological resource or site.	S	**Mitigation Measure M-GE-6: Paleontological Resources Monitoring and Mitigation Program** Prior to issuance of a building permit for construction activities that would disturb sedimentary rocks of the Franciscan Complex (based on the site-specific geotechnical investigation or other available information), the project sponsors shall retain the services of a qualified paleontological consultant having expertise in California paleontology to design and implement a Paleontological Resources Monitoring and Mitigation Program (PRMMP). The PRMMP shall specify the timing and specific locations where construction monitoring would be required; emergency discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; preconstruction coordination procedures; and procedures for reporting the results of the monitoring program. The PRMMP shall be consistent with the Society for Vertebrate Paleontology (SVP) Standard Guidelines for the mitigation of construction-related adverse impacts to paleontological resources and the requirements of the designated repository for any fossils collected. During construction, earth-moving activities that have the potential to disturb previously undisturbed native sediment or sedimentary rocks shall be monitored by a qualified paleontological consultant having expertise in California paleontology. Monitoring need not be conducted for construction activities in areas where the ground has been previously disturbed or when construction activities would encounter artificial fill, Young Bay Mud, marsh deposits, or non-sedimentary rocks of the Franciscan Complex.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		If a paleontological resource is discovered, construction activities in an appropriate buffer around the discovery site shall be suspended for a maximum of 4 weeks. At the direction of the Environmental Review Officer (ERO), the suspension of construction can be extended beyond 4 weeks if needed to implement appropriate measures in accordance with the PRMMP, but only if such a suspension is the only feasible means to prevent an adverse impact on the paleontological resource. The paleontological consultant's work shall be conducted at the direction of the City's ERO. Plans and reports prepared by the consultant shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO.	
C-GE-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would not substantially contribute to cumulative impacts on geology and soils.	LS	None required.	LS
Hydrology and Water Quality			
HY-1: Construction of the Proposed Project would not violate a water quality standard or a waste discharge requirement, or otherwise substantially degrade water quality.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
HY-2: The Proposed Project could violate a water quality standard or waste discharge requirement or otherwise substantially degrade water quality, but runoff from the Proposed Project could exceed the capacity of a storm drain system or provide a substantial source of stormwater pollutants.	S	**Mitigation Measure M-HY-2a: Design and Construction of Proposed Pump Station for Options 1 and 3** The project sponsors shall design the new pump station proposed as part of the Proposed Project to achieve the following performance criteria. • The dry-weather capacity of the new pump station and associated force main shall be sufficient to convey dry-weather wastewater flows within the 20th Street sub-basin, including flows from the existing baseline, the Proposed Project at full build-out, and cumulative project contributions; and • The wet-weather capacity of the new pump station shall be sufficient to ensure that potential wet-weather combined sewer discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average of ten discharges per year specified in the SFPUC Bayside NPDES permit or applicable corresponding permit condition at time of final design. The capacity shall be based on the existing baseline, the Proposed Project at full build-out, and cumulative project contributions, The project sponsors shall coordinate with the SFPUC regarding the design and construction of the pump station. The final design shall be subject to approval by the SFPUC. **Mitigation Measure M-HY-2b: Design and Construction of Proposed Pump Station for Option 2** The project sponsors shall design the new pump station proposed as part of the Proposed Project to achieve the following performance criteria. • The dry-weather capacity of the new pump station and associated force main shall be sufficient to convey dry-weather wastewater flows within the 20th Street sub-basin, including flows from the existing baseline, the Proposed Project at full build-out, and cumulative project contributions;	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		• During wet weather, wastewater flows from the project site shall bypass the wet-weather facilities and be conveyed to the combined sewer system in such a manner that they do not contribute to combined sewer discharges within the 20th Street sub-basin; and • The wet-weather capacity of the new pump station shall be sufficient to ensure that potential wet-weather combined sewer discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average of ten discharges per year specified in the SFPUC Bayside NPDES permit or applicable corresponding permit condition at time of final design. The capacity shall be based on the existing baseline and cumulative project contributions. The project sponsor shall coordinate with the SFPUC regarding the design and construction of the pump station. The final design shall be subject to approval by the SFPUC.	
HY-3: The Proposed Project would not substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
HY-4: The Proposed Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion, siltation, or flooding on- or off site.	LS	None required.	LS
HY-5: Operation of the Proposed Project would not place housing within a 100-year flood zone or place structures within an existing 100-year flood zone that would impede or redirect flood flows.	LS	None required.	LS
HY-6: Operation of the Proposed Project would not place structures within a future 100-year flood zone that would impede or redirect flood flows.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
HY-7: The Proposed Project would not expose people or structures to substantial risk of loss, injury, or death due to inundation by seiche, tsunami, or mudflow.	LS	None required.	LS
C-HY-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not result in a considerable contribution to cumulative impacts on hydrology and water quality.	LS	None required.	LS
Hazards and Hazardous Materials			
HZ-1: Construction and operation of the Proposed Project would not create a significant hazard through routine transport, use, or disposal of hazardous materials.	LS	None required.	LS
HZ-2: Demolition and renovation of buildings under the Proposed Project would not expose workers and the public to hazardous building	S	**Mitigation Measure M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers** The project sponsors shall retain a qualified contractor to survey any building and/or structure planned for demolition, renovation, or relocation to identify all electrical transformers in use and in storage. The contractor shall determine the	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
materials including asbestos-containing materials, lead-based paint, bis (2-ethylhexyl) phthalate (DEHP), and mercury, or result in a release of these materials into the environment during construction. However, workers and the public would be exposed to PCBs as a result of the removal of electrical transformers.		PCB content using name plate information, or through sampling if name-plate data do not provide adequate information regarding the PCB content of the dielectric equipment. The project sponsors shall retain a qualified contractor to remove and dispose of all transformers in accordance with the requirements of Title 40 of the Code of Federal Regulations, Section 761.60 (described under the Regulatory Framework) and the Title 22 of the California Code of Regulations, Section 66261.24. The removal shall be completed in advance of any building or structural demolition, renovation, or relocation. **Mitigation Measure M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed** In the event that leakage is observed in the vicinity of a transformer containing greater than 50 parts per million PCB (determined in accordance with Mitigation Measure H-HZ-2a), or the leakage has resulted in visible staining of the building materials or surrounding surface areas, the project sponsors shall retain a qualified professional to obtain samples of the building materials for the analysis of PCBs in accordance with Part 761 of the Code of Federal Regulations. If PCBs are identified at a concentration of 1 part per million, then the project sponsors shall retain a contractor to clean the surface to a concentration of 1 part per million or less in accordance with Title 40 of the Code of Federal Regulations, Section 761.61(a). The sampling and cleaning shall be completed in advance of any building or structural demolition, renovation, or relocation. **Mitigation Measure M-HZ-2c: Conduct Soil Sampling if Stained Soil is Observed** In the event that leakage is observed in the vicinity of a PCB-containing transformer that has resulted in visible staining of the surrounding soil (determined in accordance with Mitigation Measure M-HZ-2a), the project sponsors shall retain a qualified professional to obtain soil samples for the analysis of PCBs in accordance with Part 761 of the Code of Federal Regulations. If PCBs are identified at a concentration less than the residential Environmental Screening Level of 0.22 milligrams per kilogram, then no further action shall be required. If PCBs are identified at a concentration greater than or equal to the	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		residential Environmental Screening Level of 0.22 milligrams per kilogram, then the project sponsors shall require the contractor to implement the requirements of the Pier 70 RMP, as required by Mitigation Measure M-HZ-6. The sampling and implementation of the Pier 70 RMP requirements shall be completed in advance of any building or structural demolition, renovation, relocation, or subsequent development.	
HZ-3: Project development within the 28-Acre Site and 20th/Illinois Parcel would be conducted on a site included on a government list of hazardous materials sites and could encounter hazardous materials in the soil and groundwater, creating a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	S	**Mitigation Measure M-HZ-3a: Implement Construction and Maintenance-Related Measures of the Pier 70 Risk Management Plan** The project sponsors shall provide notice to the RWQCB, DPH, and Port in accordance with the Pier 70 RMP, in advance of ground-disturbing activities that would disturb an area of 1,250 square feet or more of native soil, 50 cubic yards or more of native soil, more than 0.5 acre of soil, or 10,000 square feet or more of durable cover (Pier 70 RMP Sections 4.1, 4.2, and 6.3). The project sponsors shall also (through their contractor) implement the following measures of the Pier 70 RMP during construction to provide for the protection of worker and public health, including nearby schools and other sensitive receptors, and to ensure appropriate disposition of soil and groundwater removed from the site: • A project-specific health and safety plan (Pier 70 RMP Section 6.4); • Access controls (Pier 70 RMP Section 6.1); • Soil management protocols, including those for: o soil movement (Pier 70 RMP Section 6.5.1), o soil stockpile management (Pier 70 RMP Section 6.5.2), and o import of clean soil (including preparation of a project-specific Soil Import Plan) (Pier 70 RMP Section 6.5.3); • A dust control plan in accordance with the measures specified by the California Air Resources Board for control of naturally occurring asbestos (Title 17 of California Code of Regulations, Section 93105) and	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		Article 22B of the San Francisco Health Code and other applicable regulations as well as site-specific measures (Pier 70 RMP Section 6.6); • A project-specific stormwater pollution prevention control plan (Pier 70 RMP Section 6.7); • Off-site soil disposal (Pier 70 RMP Section 6.8); • A project-specific groundwater management plan for temporary dewatering (Pier 70 RMP Section 6.10.1); • Risk management measures to minimize the potential for new utilities to become conduits for the spread of groundwater contamination (Pier 70 RMP Section 6.10.2); • Appropriate design of underground pipelines to prevent the intrusion of groundwater or degradation of pipeline construction materials by chemicals in the soil or groundwater (Pier 70 RMP Section 6.10.3); and • Protocols for unforeseen conditions (Pier 70 RMP Section 6.9). Following completion of construction activities that disturb any durable cover, the integrity of the previously existing durable cover shall be re-established in accordance with Section 6.2 of the Pier 70 RMP and the protocols described in the Operations and Maintenance Plan of the Pier 70 RMP. All plans prepared in accordance with the Pier 70 RMP shall be submitted to the RWQCB, DPH, and/or Port for review and approval in accordance with the notification requirements of the RMP (Pier 70 RMP Section 4.0). **Mitigation Measure M-HZ-3b: Implement Well Protection Requirements of the Pier 70 Risk Management Plan** In accordance with Section 6.11 of the Pier 70 RMP, the project sponsors shall review available information prior to any ground-disturbing activities to identify any monitoring wells within the construction area. The wells shall be appropriately protected during construction. If construction necessitates destruction of an existing well, the destruction shall be conducted in accordance	

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		with California and DPH well abandonment regulations, and must be approved by the RWQCB. The Port shall also be notified of the destruction. If required by the RWQCB, DPH, or the Port, the project sponsor shall reinstall any groundwater monitoring wells that are part of the ongoing groundwater monitoring network.	
HZ-4: Project development within the Hoedown Yard would be conducted on a site included on a government list of hazardous materials sites and could encounter hazardous materials in the soil and groundwater, creating a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	S	**Mitigation Measure M-HZ-4: Implement Construction-Related Measures of the Hoedown Yard Site Management Plan** In accordance with the notification requirements of the Hoedown Yard SMP (Section 4.2), the project sponsors (through their contractor) shall notify the RWQCB, DPH, and/or Port prior to conducting any intrusive work at the Hoedown Yard. During construction, the contractor shall implement the following measures of the Hoedown Yard SMP to provide for the protection of worker and public health, and to ensure appropriate disposition of soil and groundwater. • A project-specific Health and Safety Plan (Hoedown Yard SMP Section 5): o Dust management measures in accordance with the measures specified by the California Air Resources Board for control of naturally occurring asbestos (Title 17 of California Code of Regulations, Section 93105) and Article 22B of the San Francisco Health Code. The specific measures must address dust control (SMP Section 6.1) and dust monitoring (SMP Section 6.2). • Soil and water management measures, including: o soil handling (Hoedown Yard SMP Section 7.1.1), o stockpile management (Hoedown Yard SMP Section 7.1.2), o on-site reuse of soil (Hoedown Yard SMP Section 7.1.3), o off-site soil disposal (Hoedown Yard SMP Section 7.1.4), o excavation dewatering (Hoedown Yard SMP Section 7.1.5), o stormwater management (Hoedown Yard SMP Section 7.1.6),	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		o site access and security (Hoedown Yard SMP Section 7.1.7), and o unanticipated subsurface conditions (Hoedown Yard SMP Section 7.2).	
HZ-5: Operation of the Proposed Project within the PG&E Responsibility Area would expose residents, site workers, and site visitors to hazardous materials in the soil, creating a significant hazard to the public or the environment.	S	**Mitigation Measure M-HZ-5: Delay Development on Proposed Parcels H1, H2, and E3 Until Remediation of the PG&E Responsibility Area is Complete** The project sponsors shall not start construction of the proposed development or associated infrastructure on proposed Parcels H1, H2, and E3 until PG&E's remedial activities in the PG&E Responsibility Area within and adjacent to these parcels have been completed to the satisfaction of the RWQCB. During subsequent development, the project sponsors shall implement the requirements of the Pier 70 RMP within the PG&E Responsibility Area, as is enforced through the recorded deed restriction.	LSM
HZ-6: Operation of the Proposed Project within the 28-Acre Site and the 20th/Illinois Parcel would expose residents, site workers, and site visitors to hazardous materials in the soil or soil vapors, creating a significant hazard to the public or the environment.	S	**Mitigation Measure M-HZ-6: Additional Risk Evaluations and Vapor Control Measures for Residential Land Uses** The notification submittals required under Mitigation Measure M-HZ-3a shall describe site conditions at the time of development. If residential land uses are proposed at or near locations where soil vapor or groundwater concentrations exceed residential cleanup standards for vapor intrusion (based on information provided in the Pier 70 RMP) , this information shall be included in the notification submittal and the RWQCB and DPH determine whether a risk evaluation is required. If required, the project sponsors or future developer(s) shall conduct a risk evaluation in accordance with the Pier 70 RMP. The risk evaluation shall be based on the soil vapor and groundwater quality presented in the Pier 70 RMP and the proposed building design. The project sponsors shall conduct additional soil vapor or groundwater sampling as needed to support the risk evaluation, subject to the approval of the RWQCB and DPH. If the risk evaluation demonstrates that there would be unacceptable health risks to residential users (i.e., greater than 1×10^{-6} incremental cancer risk or a non-cancer hazard index greater than 1), the project sponsors shall incorporate measures into the building design to minimize or eliminate exposure to soil vapor	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		through the vapor intrusion pathway, subject to review and approval by the RWQCB and DPH. Appropriate vapor intrusion measures include, but are not limited to design of a safe building configuration that would preclude vapor intrusion; installation of a vapor barrier; and/or design and installation of an active vapor monitoring and extraction system. If the risk evaluation demonstrates that vapor intrusion risks would be within acceptable levels (less than 1×10^{-6} incremental cancer risk or a non-cancer hazard index less than 1) under a project-specific development scenario, no additional action shall be required. (For instance, the project sponsors could locate all residential uses above the first floor which, in some cases, could eliminate the potential for residential exposure to organic compounds in soil vapors.)	
HZ-7: Operation of the Proposed Project within the Hoedown Yard would expose residents, site workers, and site visitors to hazardous materials in the soil, creating a significant hazard to the public or the environment.	S	**Mitigation Measure M-HZ-7: Modify Hoedown Yard Site Mitigation Plan** The project sponsors shall conduct a risk evaluation to evaluate health risks to future site occupants, visitors, and maintenance workers under the proposed land use within the Hoedown Yard. The risk evaluation shall be based on the soil, soil vapor, and groundwater quality data provided in the existing SMP and supporting documents and the project sponsors shall conduct additional sampling as needed to support the risk evaluation. Based on the results of the risk evaluation, the project sponsors shall modify the Hoedown Yard SMP to include measures to minimize or eliminate exposure pathways to chemicals in the soil and groundwater, and achieve health-based goals (i.e., an excess cancer risk of 1×10^{-6} and a Hazard Index of 1) applicable to each land use proposed for development within the Hoedown Yard. At a minimum, the modified SMP shall include the following components: • Regulatory-approved cleanup levels for the proposed land uses; • A description of existing conditions, including a comparison of site data to regulatory-approved cleanup levels; • Regulatory oversight responsibilities and notification requirements; • Post-development risk management measures, including management measures for the maintenance of engineering controls (e.g., durable	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
		covers, vapor mitigation systems) and site maintenance activities that could encounter contaminated soil; • Monitoring and reporting requirements; and • An operations and maintenance plan, including annual inspection requirements. The risk evaluation and proposed risk management plan shall be submitted to the RWQCB, DPH, and Port for review and approval prior to the start of ground disturbance.	
HZ-8: Operation of the Irish Hill Playground would expose site visitors to naturally occurring asbestos and naturally occurring metals, creating a significant hazard to the public or the environment.	S	**Mitigation Measure M-HZ-8a: Prevent Contact with Serpentinite Bedrock and Fill Materials in Irish Hill Playground** The project sponsors shall ensure that a minimum 2-foot thick durable cover of asbestos-free clean imported fill with a vegetated cover is emplaced above serpentinite bedrock and fill materials in the level portions of Irish Hill Playground. The fill shall meet the soil criteria for clean fill specified in Table 4 of the Pier 70 RMP and included in Appendix F, Hazards and Hazardous Materials, of this EIR. Barriers shall be constructed to preclude direct climbing on the bedrock of the Irish Hill remnant. The design of the durable cover and barriers shall be submitted to the DPH and Port for review and approval prior to construction of the Irish Hill Playground. **Mitigation Measure M-HZ-8b: Restrictions on the Use of Irish Hill Playground** To the extent feasible, the project sponsors shall ensure that the Irish Hill Playground is not operational until ground disturbing activities for construction of the new 21st Street and on the adjacent parcels (PKN, PKS, HDY-1, HDY2, C1, and C2) is completed. If this is not feasible, and Irish Hill Playground is operational prior to construction of the new 21st Street and construction on all adjacent parcels, the playground shall be closed for use when ground-disturbing activities are occurring for the construction of the new 21st Street and on any of the adjacent parcels.	LSM

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
HZ-9: The Proposed Project would not handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Although construction activities would emit diesel particulate matter and naturally occurring asbestos, these emissions would not result in adverse effects on nearby schools.	LS	None required.	LS
HZ-10: The Proposed Project would not expose people or structures to a significant risk of loss, injury, or death involving fires, nor would it impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-HZ-1: The Proposed Project, in combination with other past, present or reasonably foreseeable future projects in the project vicinity, would not result in a considerable contribution to significant cumulative impacts related to hazards and hazardous materials.	LS	None required.	LS
Mineral and Energy Resources			
ME-1: The Proposed Project would not have a significant adverse impact on the availability of a known mineral resource and/or a locally important mineral resource recovery site.	NI	None required.	NI
ME-2: The Proposed Project would not have a substantial adverse effect on the use of fuel, water, or energy consumption, and would not encourage activities that could result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
ME-3: The Proposed Project would not result in new or expansion of existing electric or natural gas transmission and/or distribution facilities that would cause significant physical environmental effects.	LS	None required.	LS
C-ME-1: The Proposed Project, in combination with other past, present and reasonably foreseeable future projects in the vicinity, would not result in a cumulatively considerable contribution to a significant adverse cumulative impact on mineral and energy resources.	LS	None required.	LS

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
Agriculture and Forest Resources			
AG-1: The Proposed Project would not convert designated farmland under the Farmland Mapping and Monitoring Program, nor would it conflict with any existing agricultural zoning or a Williamson Act contract, nor would it involve any changes to the environment that would result in the conversion of designated farmland.	NI	None required.	NI
AG-2: The Proposed Project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland, nor would it result in the loss of or conversion of forest land to non-forest uses.	NI	None required.	NI

Table S.1 Continued

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
C-AG-1: The Proposed Project, in combination with other past, present and reasonably foreseeable future projects in the vicinity, would not result in a cumulatively considerable contribution to a significant adverse cumulative impact on agricultural resources or forest land or timberland.	NI	None required.	NI

Source: Turnstone/SWCA

C. SUMMARY OF PROJECT VARIANTS

Four project variants are evaluated in this EIR, and are described in detail in Chapter 6, Variants. These include: a Reduced Off-Haul Variant; a District Energy System; a Wastewater Treatment and Reuse System (WTRS); and an Automated Waste Collection System (AWCS). There is one proposed construction-related variant of the Proposed Project and three proposed variants on infrastructure features of the Proposed Project, all of which focus on sustainability.

For each variant, all other features would be the same as or similar to the Proposed Project. The variants do not involve any change to the mix of land uses, the space allocation of uses, or the residential unit count under the Maximum Residential and Maximum Commercial Scenarios of the Proposed Project. Likewise, the variants would not involve any change to the locations, configurations, or building envelopes of the programmed development under the two scenarios analyzed for the Proposed Project. Physical environmental effects from the project variants would be the same or similar to the Proposed Project. All mitigation measures and improvement measures identified for the Proposed Project would be the same under the project variants.

Reduced Off-Haul Variant

The Reduced Off-Haul Variant is a construction-related variant. It is focused on minimizing the overall volume of excavated soils and the number of off-haul truck trips required for the transport and disposal of excavated soils. The strategy for achieving a reduction in the volume of excavated soils and the resultant off-haul truck trips is three-fold: 1) modify the preliminary grading plan developed for the Proposed Project to raise the base elevation for a portion of the 28-Acre Site; 2) eliminate the proposed 15-foot-deep below-grade basement levels at selected locations on the 28-Acre Site and extend the footprint of one proposed 15-foot-deep below-grade basement level; and 3) eliminate a portion of one of the two below-grade basement levels on Parcel C1. The combination of the proposed increase to the base elevation on a portion of the 28-Acre Site and the modifications to the below-grade basement level parking program would result in an approximately 56 percent reduction in the volume of excavated soils that would need to be transported off site (from approximately 340,000 cubic yards under the Proposed Project to approximately 150,000 cubic yards).

District Energy System Variant

Under the District Energy System Variant, building space heating and space cooling systems within the project site would be linked together via an underground shared energy distribution and exchange loop. This variant would include a single central plant with boilers and chillers to regulate the water temperature circulating in the network of subsurface pipes and laterals leading

to all buildings on the 28-Acre-Site. The central plant would be located in the basement of a building on Parcel C1, which is located at the corner of new Louisiana and 21st streets. Development of Parcel C1 could be an above grade parking structure, a residential building, or commercial building, all with two below-grade basement levels. Up to five 15- to 20-foot-tall cooling towers would be located on the roof or would be located adjacent to the building and would obviate the need, under the Proposed Project, for a mechanical cooling tower located on the roof of each building.

Each building on the project site would have heat pumps and a point-of-connection to the energy distribution loop tied to the water loop to provide space heating, hot water, and cooling to more efficiently meet building thermal demands. Buildings that require heat would remove heat from the loop. Buildings that require cooling would reject that heat by pumping heated water into the loop, thereby enhancing the efficiency of each building's heating, ventilation, and air conditioning system. To maintain the loop at a desired temperature, the central plant would use natural gas-fired boilers to increase heat and cooling towers to reject heat.

Wastewater Treatment and Reuse System Variant

Under the WTRS Variant, wastewater in the form of blackwater, graywater, and rainwater would be collected from all newly constructed buildings, treated, and reused for toilet and urinal flushing, irrigation, and cooling towers. The WTRS Variant is an infrastructure-related variant. The variant is different from the Proposed Project because it would include a centralized facility (as opposed to the capture of graywater, and rain water, and its reuse within the individual building). Unlike the Proposed Project, this variant also assumes blackwater (wastewater from toilets, urinals, dishwashers, kitchen sinks, and utility sinks containing feces, urine, other bodily wastes, or other biological wastes) would be collected and treated along with the graywater, and rainwater, that would be captured under the Proposed Project.

The WTRS Variant would consist of a single treatment facility to be located in an existing building (Building 108) or in a new building (approximately 20,000 square feet and 35 feet tall) on the BAE Systems Ship Repair site north of 20th Street opposite the proposed commercial office uses on Parcels A and B.

Automated Waste Collection System Variant

An AWCS Variant is under consideration by the project sponsor because it has the potential to operate more efficiently and reduce the number of trash collection truck trips and the associated noise. The automated waste collection system would be designed to accept recyclables, compostables, and trash at separate loading stations in buildings and in public areas. These waste streams would then be transported through a subsurface pipeline system to a central waste

collection facility. In order to minimize the potential for odors from organic decomposition and other odorous waste, the subsurface pipeline system would be designed to be under negative pressure (i.e., vacuum towards the central waste collection facility) and activated carbon filters would be used to eliminate odors at the system exhaust.

Under the AWCS Variant, residents, workers, and visitors would deposit recyclables, compostables, and trash in designated receptacles both within and outside of buildings. Once deposited, the material would be temporarily stored at the loading point. A pneumatic system would direct the solid waste through the subsurface pipeline system to the central waste collection facility. The central waste collection facility would be up to 10,000 square feet and up to 35 feet in height. It would be located outside of the project site on land north of Parcels A and B on the BAE Systems Ship Repair site (a surface parking lot) and would likely be constructed as part of the first phase of development

D. SUMMARY OF PROJECT ALTERNATIVES

Three alternatives are evaluated in this EIR: the No Project Alternative; the Code Compliant Alternative; and the 2010 Pier 70 Master Plan Alternative. The three alternatives are described in detail in Chapter 7, Alternatives. Table S.2: Comparison of Project and Alternative Impacts, on pp. S.118-S.122, shows a comparison of the potential environmental impacts that may result from the alternatives to those of the Proposed Project.

No Project Alternative

CEQA Guidelines Section 15126.6(e) requires that, among the project alternatives, a "no project" alternative be evaluated. CEQA Guidelines Section 15126.6(e)(2) requires that the no project alternative analysis "discuss the existing conditions…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and policies and consistent with the available infrastructure and community services." As noted in CEQA Guidelines Section 15126.6, an EIR on "a development project on identifiable property," typically analyzes a no project alternative, i.e., "the circumstance under which the project does not proceed. Such a discussion would compare the environmental effects of the property remaining in its existing state against environmental effects that would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this 'no project' consequence should be discussed."

DESCRIPTION

Under the No Project Alternative, existing conditions at the Pier 70 project site would not change. Under this alternative, there would be no exchange of land under the Public Trust Exchange Agreement. The 35-acre project site that contains approximately 351,800 gsf of mostly vacant buildings and facilities, most of which are unoccupied, would be retained in its current condition with the current level of maintenance. Current uses on the site, all of which are on short-term leases or temporary, would continue. The Port would continue to renew the existing short-term leases on the project site; no tenant relocation plan would be proposed. While it is likely that the Port and/or developers could develop portions or all the 28-Acre Site and Illinois Parcels over a period of time, such development is speculative and therefore not analyzed under the No Project Alternative.

Under the No Project Alternative, there would be no amendment to the Planning Code, no rezoning of the entire 35-acre project site, and no adoption of a SUD enabling development controls. None of the approximately 3,422,265 gsf or 801,400 gsf of new buildings and improvements to existing structures on the 28-Acre Site and the Illinois Parcels, respectively, proposed as part of the Proposed Project would be constructed or improved. No new proposed residential, commercial, RALI, or open space uses would be constructed on the project site under this alternative. No affordable residential units complying with the City's Affordable Inclusionary Housing Ordinance would be built. There would be no demolition or rehabilitation of contributing historic architectural resources in the Union Iron Works (UIW) Historic District on the project site under the No Project Alternative; no traffic or street and circulation improvements; no infrastructure or utilities improvements; no new 20th Street pump station; no grading or stabilization improvements; and no shoreline protection or sea level rise adaptation strategies on the project site.

Code Compliant Alternative

DESCRIPTION

The purpose of the Code Compliant Alternative is to evaluate a development scheme that would meet applicable provisions of the Planning Code and would not require any Planning Code amendments.

Under this alternative, there would be no establishment of an SUD; the project site would remain in M-2 and P Zoning Districts. The Code Compliant Alternative would include approximately 1,881,360 gsf of development, about 45 percent less than under the Proposed Project overall. This alternative would include 590 residential units totaling 519,950 gsf, 1,162,260 gsf of commercial (office) use, 156,780 gsf of retail use, and 42,370 gsf of arts/light-industrial uses.

The Code Compliant Alternative would provide 150 on-street vehicle parking spaces and 985 off-street spaces located on several surface parking lots on the site. Under this alternative, 5.76 acres of public open space would be constructed, including promenade and terrace areas along the waterfront, an Irish Hill playground area, and a plaza and market square around Building 12. Unlike the Proposed Project, this alternative does not include the Maximum Residential Scenario and the Maximum Commercial Scenario as optional development scenarios.

Under this alternative, the project site would remain within the existing Height and Bulk Districts of 65-X and 40-X. No voter approval would be required pursuant to Proposition B under the Code Compliant Alternative because no changes to the height districts would be proposed.

Like the Proposed Project, this alternative would include a Design for Development document comparable to that of the Proposed Project, but would apply specifically to the height districts, use program, and site plan for streets, configuration of parcels, and open spaces under this alternative. As with the Proposed Project, the Design for Development under this alternative would establish standards and guidelines for the rehabilitation of historic buildings, buildable zones for infill construction, and would contain project-wide as well as location-specific massing and architecture requirements that would govern the design of infill construction within the project site to ensure architectural compatibility with historic buildings within the UIW Historic District.

Under the Code Compliant Alternative, 237,800 gsf located in Buildings 2, 12, and 21 on the project site would be retained and rehabilitated in accordance with Secretary of the Interior's Standards. As with the Proposed Project, the northern spur of the Irish Hill remnant would be removed.to allow for the construction of 21st Street. Also, as under the Proposed Project, Building 21 would be relocated about 75 feet to the southeast. The remaining seven structures on the project site (Buildings 11, 15, 16, 19, 25, 32, and 66), containing 123,200 gsf, would be demolished.

Similar to the Proposed Project, the Code Compliant Alternative includes construction of transportation and circulation improvements. Under this alternative, the following transportation and circulation improvements would be implemented: construction of new 21st Street, reconstruction of 20th and 22nd streets, and construction of new Louisiana and Maryland streets. All new and reconstructed streets would be built with sidewalks. As under the Proposed Project, the Code Compliant Alternative would include the same bicycle circulation improvements (Bay Trail extension, Class II and Class III facilities on internal streets, and a bikeshare location). The Code Compliant Alternative would include same Transportation Demand Management (TDM) program as the Proposed Project, with exception of those items that pertain only to residential tenants. A TDM program would include the following: establishment of a Transportation Management Agency (TMA) that employs an on-site transit coordinator, operation of a shuttle

system, maintenance of a TMA website with real-time transit information, distribution of educational documents, coordination of ride-matching services, enrollment in Emergency Ride Home program, employment of a structured parking strategy, unbundled residential and commercial parking, provision of car-share parking spaces, metering of on-street parking, and parking wayfinding signage across the site.

Under this alternative, new and upgraded utilities and infrastructure would be constructed, including a new 20th Street pump station. A combined sewer and stormwater system would be built, similar to Option 1 under the Proposed Project, but it would have slightly different alignments due to different building and roadway siting and locations. Unlike the Proposed Project, this alternative does not include variants. The Code Compliant Alternative would further some of the project sponsors' objectives.

The Code Compliant Alternative includes about 47,962 cubic yards of off-haul of excavated materials and about 8,900 cubic yards of clean fill import. This alternative includes construction of an engineered berm along the eastern property boundary with an approximately 3:1 slope and a maximum height of approximately 4 feet to address projected sea level rise flooding risks. Shoreline protection improvements, including placing rip-rap along the water's edge, under this alternative would be similar to those under the Proposed Project. Like the Proposed Project, implementation of this alternative would take place over a period of 11 years, similar to the Proposed Project, and in several phases (up to five for the Proposed Project, up to four for this alternative).

Under this alternative, an exchange of land under the Public Trust Exchange Agreement would occur under in order to clarify the Public Trust status of portions of Pier 70 that would free some portions of the project site from the Public Trust while committing others to the Public Trust.

2010 Pier 70 Master Plan Alternative

DESCRIPTION

The purpose of the 2010 Pier 70 Master Plan Alternative is to evaluate the environmental impacts of a development scheme for the project site that conforms with the Port of San Francisco's *2010 Pier 70 Preferred Master Plan*. See "Port of San Francisco Pier 70 Preferred Master Plan" in Chapter 3, Plans and Policies, on pp. 3.7-3.9. The 2010 Pier 70 Master Plan Alternative includes approximately 31.4 acres, and would not include development on the 3.6-acre Hoedown Yard; this parcel would continue to be owned and operated by PG&E as a storage and maintenance yard.

Similar to the Proposed Project, this Alternative would amend the *General Plan* and Planning Code, adding a new Pier 70 SUD, which would establish land use and zoning controls for the 31.4-acre site. (See Figure 7.3: 2010 Pier 70 Master Plan Alternative – Land Use Plan in Chapter 7, Alternatives, p. 7.58.) The existing Zoning Map would be amended to show changes from the current Zoning District (M-2 and P) to the proposed SUD zoning. Under this alternative, as under the Proposed Project, the existing Height and Bulk Districts of 65-X and 40-X would be increased to 90-X, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet, but would become public open space under this alternative. (See Figure 7.4: 2010 Pier 70 Master Plan Alternative – Maximum Height Plan in Chapter 7, Alternatives, p. 7.60.)

The 2010 Pier 70 Master Plan Alternative would include approximately 2,153,330 gsf of development, about 50 percent less square footage than under the Proposed Project. (See Figure 7.3.) This alternative would include 195 residential units totaling 160,440 gsf, 1,698,780 gsf of commercial (office) use, 188,610 gsf of retail use, and 105,500 gsf of arts/light-industrial uses. The 2010 Pier 70 Master Plan Alternative would provide 405 on-street vehicle parking spaces and 2,120 off-street spaces located on several surface parking lots on the site. Under this alternative, 8.07 acres of open space would be constructed, including promenade and terrace areas along the waterfront, a plaza and market square around Buildings 2 and 12, an open space block along the northern portion of the 28-Acre Site, and a plaza on 20th Street around Building 3A. Unlike the Proposed Project, this alternative does not include the Maximum Residential Scenario and the Maximum Commercial Scenario as optional development scenarios.

Like the Proposed Project, this alternative would include a Design for Development document comparable to that of the Proposed Project, but would apply specifically to the height districts, use program, and site plan for streets, configuration of parcels, and open spaces under this alternative. As with the Proposed Project, the Design for Development under this alternative would establish standards and guidelines for the rehabilitation of historic buildings, buildable zones for infill construction, and would contain project-wide as well as location-specific massing and architecture requirements that would govern the design of infill construction within the project site to ensure architectural compatibility with historic buildings within the UIW Historic District.

Under the 2010 Pier 70 Master Plan Alternative, a total of 293,228 gsf of existing buildings would be retained and rehabilitated in accordance with the Secretary of the Interior's Standards. Buildings 2, 12, and 19 on the project site would be retained and rehabilitated in their current location, and Building 21 would be relocated just to the south of the Historic Core boundary, at the intersection of Louisiana and 21st streets within the project site. The remaining six structures on the project site (Buildings 11, 15, 16, 25, 32, and 66), containing about 858,572 gsf, would be demolished. As with the Proposed Project, the northern spur of the Irish Hill remnant would be

removed to allow for the construction of 21st Street. Similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative includes construction of transportation and circulation improvements. Under this alternative, the following transportation and circulation improvements would be implemented: construction of new 21st Street, reconstruction of 20th and 22nd streets, and construction of new Louisiana and Maryland streets. All new and reconstructed streets would be built with sidewalks. The 2010 Pier 70 Master Plan Alternative would include the same bicycle circulation improvements (Bay Trail extension, Class II and Class III facilities on internal streets, and a bikeshare location) as the Proposed Project. The 2010 Pier 70 Master Plan Alternative would include the same TDM program as the Proposed Project, with exception of those items that pertain only to residential tenants. The TDM program would include establishment of a TMA that employs an on-site transit coordinator, operation of a shuttle system, maintenance of a TMA website with real-time transit information, distribution of educational documents, coordination of ride-matching services, enrollment in Emergency Ride Home program, employment of a district parking strategy, unbundled residential and commercial parking, provision of car-share parking spaces, metering of on-street parking, and parking wayfinding signage across the site.

Under this alternative, new and upgraded utilities and infrastructure, and a new 20th Street pump station, would be constructed. A combined sewer and stormwater system would be built, similar to Option 1 under the Proposed Project, but with slightly different alignments due to different building and roadway siting and locations. Unlike the Proposed Project, this alternative does not include variants. The 2010 Pier 70 Master Plan Alternative would further some of the project sponsors' objectives.

The 2010 Pier 70 Master Plan Alternative includes about 47,962 cubic yards of off-haul of excavated materials and about 8,900 cubic yards of clean fill import. It also includes construction of an engineered berm along the eastern property boundary with an approximately 3:1 slope and a maximum height of approximately 4 feet to address projected sea level rise flooding risks. Shoreline protection improvements under this alternative, including placement of new rip-rap along the water's edge, would be similar to those under the Proposed Project. Like the Proposed Project, implementation of this alternative would take place over a period of 11 years and in several phases (up to five for the Proposed Project, up to four for this alternative). Similar to the Proposed Project, an exchange of land under the Public Trust Exchange Agreement would occur under the 2010 Pier 70 Master Plan Alternative in order to clarify the Public Trust status portions of Pier 70, which would free some portions of the project site from the Public Trust while committing others to the Public Trust.

Table S.2: Comparison of Proposed Project to Alternatives and Summary of their Significant and Unavoidable Impacts

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Legend: NI = No Impact; LS = Less than Significant; S = Significant; SU = Significant and unavoidable; SUM = Significant and unavoidable impact with mitigation; NA = Not Applicable					
Characteristics of Proposed Project and Alternatives					
Zoning/Height Limits	SUD/65-X, 90-X, 40-X	SUD/65-X, 90-X, 40-X	M-2/65-X, 40-X	M-2 and P/65-X, 40-X	SUD/90-X
Existing buildings (gsf)	351,800	351,800	351,800	351,800	351,800
Existing buildings to be retained (gsf)	237,800	237,800	351,800	237,800	293,228
Residential (gsf)	2,630,000	1,430,000	0	519,950	160,440
No. of units	3,025	1,645	0	590	195
Commercial (gsf)	1,102,250	2,262,350	0	1,162,260	1,698,780
RALI (gsf)	479,980	486,950	0	199,150	294,110
Retail	269,795	275,075	0	156,780	188,610
Restaurant	67,375	68,765	0	0	0
Arts/Light-Industrial	143,110	143,110	0	42,370	105,500
Total (gsf)	**4,212,230**	**4,179,300**	**351,800**	**1,881,360**	**2,153,330**
Total Parking (spaces)	3,656	3,781	323	1,135	2,525
Off-street	3,371	3,496	171	985	2,120
On-street	285	285	152	150	405
Open Space	9 acres	9 acres	0	5.76 acres	8.07 acres
Grading (cy)					
Export	340,000	340,000	0	47,962	47,962

Table S.2 Continued

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Import	20,000	20,000	0	8,900	8,900
Ability to meet Project sponsors Objectives?*	Yes	Yes	No	Some	Some
Summary of Significant and Unavoidable Impacts of Proposed Project and Alternatives					
Transportation					
TR-5: The Proposed Project would cause one individual Muni route to exceed 85 percent capacity utilization in the a.m. and p.m. peak hours in both the inbound and outbound directions.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
TR-12: The Proposed Project's loading demand during the peak loading hour would not be adequately accommodated by proposed on-site/off-street loading supply or in proposed on-street loading zones, which may create hazardous conditions or significant delays for transit, bicycles, or pedestrians.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
C-TR-4: The Proposed Project would contribute considerably to significant cumulative transit impacts on the 48 Quintara/24th Street and 22 Fillmore bus routes.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)

Table S.2 Continued

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Noise and Vibration					
NO-2: Construction of the Proposed Project would cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
NO-5: Operation of the Proposed Project would cause substantial permanent increases in ambient noise levels along some roadway segments in the project site vicinity.	SUM	SUM	NI	Similar to but less than the Proposed Project (SU)	Similar to but less than the Proposed Project (SU)
C-NO-2: Operation of the Proposed Project, in combination with other cumulative development would cause a substantial permanent increase in ambient noise levels in the project vicinity.	SUM	SUM	NI	Less than the Proposed Project (LS)	Less than the Proposed Project (LS)

Table S.2 Continued

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Air Quality					
AQ-1: Construction of the Proposed Project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
AQ-2: At project build-out, the Proposed Project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
C-AQ-1: The Maximum Residential or Maximum Commercial scenarios, in combination with past, present, and reasonably foreseeable future development in the project area would contribute to cumulative regional air quality impacts.	SUM	SUM	NI	Similar to but less than the Proposed Project (SU)	Similar to but less than the Proposed Project (SU)

Source: Forest City 2016, SWCA 2016.

E. ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The EIR is required to identify the environmentally superior alternative that has the fewest significant environmental impacts from among the other alternatives evaluated. The Proposed Project would result in significant and unavoidable impacts related to transportation (transit), noise, and air quality.

The Code Compliant Alternative is the environmentally superior alternative. Due to the substantially lower number of residential units and the decrease in the amount of commercial and RALI space to be constructed and occupied under the Code Compliant Alternative, that Alternative would lessen (but not avoid) the significant adverse impacts identified for the Proposed Project related to the topics of transportation, noise, and air quality.

Additionally, the Code Compliant Alternative would also lessen impacts of the Proposed Project that were found to be less than significant, or less than significant with mitigation, related to the topics of Land Use, Population and Housing, Cultural Resources (Archeological and Historic Architectural), Greenhouse Gas Emissions, Wind, Shadow, Recreation, Utilities and Service Systems, Public Services, Geology and Soils, Hazards and Hazardous Materials, and Mineral and Energy Resources. (There are no Agricultural Resources within the project site.)

The Code Compliant Alternative would partially meet the objectives of the Proposed Project. Like the Proposed Project, it would retain, rehabilitate, and reuse a former industrial complex that would continue to be a part of an historic district. It would provide public open spaces and waterfront access, commercial and retail space, and would contribute market-rate and affordable units toward meeting San Francisco's regional housing needs. However, it would provide substantially less public open space, market-rate and affordable residential units, and commercial and retail space than the Proposed Project. This alternative would not elevate building parcels, nor would it include a financing strategy to enable the project to adapt to future, increased levels of sea level rise. This alternative would not construct a high-quality, public-private development project that could attract sources of public investment, equity, and debt financing to fund site and infrastructure costs, and ongoing maintenance, and produce a market rate return investment that allows the Port to further its Public Trust mandate and mission.

F. AREAS OF KNOWN CONTROVERSY AND ISSUES TO BE RESOLVED

The Planning Department published an NOP on May 6, 2015, announcing its intent to prepare and distribute an EIR (the NOP is included in this EIR as Appendix A). The public review period began on May 6, 2015, and ended on June 5, 2015. During the NOP public review period, five

comment letters were submitted to the Planning Department by public agencies and other interested parties. On May 28, 2015, a public scoping meeting was held and four speakers contributed comments. A Notice of Preparation Public Comments Summary Report was prepared.[21]

Comments raised the following issues:

- Plans and Policies: Comments raised issues concerning the need for the EIR to evaluate conflicts between the Proposed Project and the goals of the *Central Waterfront Area Plan*.
- Land Use and Land Use Planning: A comment noted that the EIR should evaluate physical land use impacts from the Proposed Project and other past, present, and reasonably foreseeable projects. Also, a commenter noted that land use conflicts may arise from rezoning the Illinois Parcels.
- Cultural Resources: Comments raised issues concerning impacts of the Proposed Project on the historic and existing industrial land uses of the area.
- Transportation and Circulation: Comments raised issues concerning the Proposed Project's connectivity with the rest of San Francisco, particularly by way of 20th and 22nd streets; traffic and pedestrian safety impacts, specifically at the Illinois Parcels; traffic conflicts between the Proposed Project and the trucking route along Illinois Street, as well as noise, air quality, and pedestrian safety impacts created by trucks; the Transportation Impact Study prepared for the EIR; a TDM Plan that would reduce vehicle trips; mitigation measures to be included in the EIR; transportation impact fees; and consistency with the Waterfront Transportation Assessment.
- Noise: A comment asserted that the EIR should evaluate the noise impacts from nearby industrial uses (e.g., BAE Systems Ship Repair facility, PG&E Potrero Substation, and American Industrial Center) on future residents and employees.
- Air Quality: A comment asserted that the EIR should evaluate the air quality and odor impacts from the nearby industrial uses on future residents and employees.
- Hazards and Hazardous Materials: Comments raised concerns about serpentine soils, potential soil/groundwater contamination from underground tanks, and contaminated soil from past industrial uses on the project site and the risks to future residents and employees. One comment recommended that a full environmental remediation of the project site be considered, in accordance with Proposition D.
- Recreation: A comment stated that the EIR should consider the Bay Area Water Trail, and that storage, access, and landing areas remain available for non-motorized small watercraft (e.g., kayaks and canoes) who wish to use San Francisco Bay.
- Utilities: Comments raised issues concerning the need for the EIR to include City of San Francisco Ordinances regarding irrigation, use of non-potable water during construction, and water efficiency; stormwater management requirements and system configuration; the proposed recycled water system; updates to the Water Supply Assessment; and the

[21] *Pier 70 Mixed-Use District EIR NOP Public Scoping Summary*, September 16, 2015.

design of proposed utility systems, including the water distribution, wastewater, stormwater, and sewer/storm drain systems.

- Cumulative Impacts: A comment noted several projects that should be considered in the cumulative analysis, including the adjacent PG&E site (potential for redevelopment), water taxis, a second BART tunnel, and any other miscellaneous projects in the adjacent Dogpatch neighborhood.
- Alternatives: Comments suggested two alternatives to be considered in the EIR: a Reduced Parking Alternative and a Maximum Housing Alternative.
- General: A comment stated that the EIR should incorporate factual, direct statements as opposed to vague terminology.

Comments expressing support for the Proposed Project or opposition to it will be considered independent of the environmental review process by City decision-makers, as part of their decision to approve, modify, or disapprove the Proposed Project.

1. INTRODUCTION

Chapter 1, Introduction, presents a summary of the Pier 70 Mixed-Use District Project, outlines the purpose of this Environmental Impact Report (EIR), summarizes the environmental review process, and describes the organization of the EIR.

A. PROJECT SUMMARY

The Pier 70 area (Pier 70) encompasses approximately 69 acres of historic shipyard property along San Francisco's Central Waterfront. Most of Pier 70 is listed on the National Register of Historic Places as the Union Iron Works Historic District (UIW Historic District or Historic District). Pier 70 is owned by the City and County of San Francisco through the Port of San Francisco (Port). The Port intends to rehabilitate and redevelop Pier 70, and has selected Forest City Development California, Inc. (Forest City) to act as master developer for 28 acres of the Pier 70 site, and initiate rezoning and development of design standards and controls for a multi-phased, mixed-use development on that site and two adjacent parcels. Together, the Port and Forest City are the project sponsors for the Pier 70 Mixed-Use District Project (Proposed Project).

The project site is an approximately 35-acre area bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. The site is divided into two development areas, the 28-Acre Site and the Illinois Parcels (the 20th/Illinois Parcel and the Hoedown Yard), which contain approximately 351,800 gross square feet (gsf) of deteriorating buildings and facilities. The majority of the project site is located within the UIW Historic District. The 28-Acre Site includes 12 of the 44 contributing historic resources and one of the ten non-contributing resources to the Historic District. All current uses on the site are temporary.

The Proposed Project would include market-rate and affordable residential uses, commercial use, retail/arts/light-industrial (RALI) uses, parking, shoreline improvements, infrastructure development and street improvements, and public open space. Project implementation would require amendments to the *San Francisco General Plan* and San Francisco Planning Code, adding a new Pier 70 Special Use District (SUD), changes to the Zoning Maps, and Planning Code text amendments to modify existing height limits and amendments to the Port's *Waterfront Land Use Plan*. The land use program under the SUD would be flexible, allowing for the development of certain parcels with either primarily commercial-office or residential uses, or, for two parcels on the project site (Parcels C1 and C2), structured parking. The Proposed Project would be implemented in up to five phases and would encompass between 4,179,300 to 4,212,230 gsf of new and rehabilitated development at build-out. Three contributing features to the UIW Historic District on the 28-Acre Site would be rehabilitated, consistent with the

Secretary of Interior's Standards for Treatment of Historic Properties, and adaptively reused. The Proposed Project would demolish seven contributing sheds, structures, and features on the site.[1]

B. PURPOSE OF THIS ENVIRONMENTAL IMPACT REPORT

This EIR has been prepared by the San Francisco Planning Department (Planning Department) in the City and County of San Francisco, the Lead Agency for the Proposed Project, in compliance with the provisions of the California Environmental Quality Act (CEQA) and the CEQA Guidelines (California Public Resources Code Section 21000 et seq., and California Code of Regulations Title 14, Section 15000 et seq., "CEQA Guidelines"), and Chapter 31 of the San Francisco Administrative Code. The lead agency is the public agency that has the principal responsibility for carrying out or approving a project.

Pursuant to CEQA Guidelines Section 15161, this is a project-level EIR, defined as an EIR that examines the physical environmental impacts of a specific development project. This EIR assesses potentially significant impacts in the areas of land use and land use planning, population and housing, cultural resources (archeological resources and historic architectural resources), transportation and circulation, noise and vibration, air quality, greenhouse gas emissions, wind and shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral and energy resources, and agriculture and forest resources. As defined in CEQA Guidelines Section 15382, a "significant effect on the environment" is:

> . . . a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

On September 27, 2013, Governor Brown signed Senate Bill (SB) 743, which became effective on January 1, 2014. Among other things, SB 743 added Section 21099 to the California Public Resources Code, which removes requirements for the analysis of aesthetics and parking impacts for certain urban infill projects from CEQA. The Proposed Project meets the definition of a mixed-use residential project on an infill site located within a transit priority area as specified by California Public Resources Code Section 21099.[2] Accordingly, this EIR does not contain a

[1] An additional building located on the project site, Building 117, is proposed by the Port to be demolished prior to approval of the Proposed Project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code. San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

[2] San Francisco Planning Department, *Transit-Oriented Infill Project Eligibility Checklist*, Pier 70 Mixed Use Project, Case No. 2014-001272ENV, dated November 18, 2015.

separate discussion of the topic of aesthetics, which can no longer be considered in determining the Proposed Project's physical environmental effects under CEQA. The EIR nonetheless provides visual simulations for informational purposes as part of Chapter 2, Project Description. In addition, parking is discussed for informational purposes in Section 4.C, Transportation and Circulation. (See Section 4.A, Introduction to Chapter 4, pp. 4.A.3-4.A.5, for further discussion of SB 743 and California Public Resources Code Section 21099.)

This EIR assesses potentially significant impacts of the Proposed Project. As stated in CEQA Guidelines Section 15121(a), an EIR is an informational document intended to inform public agency decision-makers and the public of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. CEQA requires that public agencies not approve projects until all feasible means available have been employed to substantially lessen the significant environmental effects of such projects.

Before any discretionary project approvals may be granted for the Proposed Project, the San Francisco Planning Commission (Planning Commission) must certify the EIR as adequate, accurate, and objective. EIR adequacy is defined in CEQA Guidelines Section 15151, Standards for Adequacy of an EIR, which states:

> An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

The degree of specificity required in an EIR should "correspond to the degree of specificity involved in the underlying activity which is described in the EIR" (CEQA Guidelines Section 15146).

City decision-makers will use the certified EIR, along with other information and public processes, to determine whether to approve, modify, or disapprove the Proposed Project, and to require any feasible mitigation measures as conditions of project approval.

C. ENVIRONMENTAL REVIEW PROCESS

On November 5, 2014, the project sponsors, the Port and Forest City, submitted an Environmental Evaluation Application for the Pier 70 Mixed-Use District Project to the Planning

Department.[3] The environmental review process for the Proposed Project includes a number of steps: publication and circulation for public comment of a Notice of Preparation (NOP), publication of a Draft EIR for public review and comment, preparation and publication of responses to public and agency comments on the Draft EIR, and certification of the Final EIR. These steps are described below.

Notice of Preparation

The Planning Department published an NOP of an EIR on May 6, 2015, announcing its intent to prepare and distribute an EIR on the Pier 70 Mixed-Use District Project (Appendix A to this EIR).

PUBLIC REVIEW OF AND COMMENTS ON THE NOTICE OF PREPARATION

Publication of the NOP initiated a 30-day public review and comment period that ended on June 5, 2015. Pursuant to the California Public Resources Code Section 21083.9 and CEQA Guidelines Section 15206, a public scoping meeting was held on May 28, 2015, to receive oral comments concerning the scope of the EIR. Four commenters spoke at the meeting. In addition to these comments, the Planning Department received five comment letters from interested parties during the public review and comment period. The comment letters received in response to the NOP and a copy of the transcript from the public scoping meeting are available for review at the Planning Department offices as part of Case File No. 2014-001272ENV. The Planning Department has considered the comments made by the public in preparation of the Draft EIR for the Proposed Project. Comments on the NOP that relate to environmental issues are summarized below and are addressed in this EIR, as noted.

Comments on the NOP raised the following issues:

Plans and Policies: Comments raised issues concerning the need for the EIR to evaluate conflicts between the Proposed Project and the goals of the *Central Waterfront Area Plan*. The Proposed Project's compatibility with applicable plans and policies is discussed in Chapter 3, Plans and Policies.

Land Use and Land Use Planning: A comment noted that the EIR should evaluate physical land use impacts from the Proposed Project and other past, present, and reasonably foreseeable projects. Project-specific and cumulative land use impacts are discussed in Section 4.B, Land Use and Land Use Planning, pp. 4.B.17-4.B.28.

[3] Environmental Evaluation Application for the Pier 70 Mixed-Use District Project, dated November 5, 2014.

Cultural Resources: Comments raised issues concerning impacts of the Proposed Project on the historic and existing industrial land uses of the area. The Proposed Project's impacts on historical resources are evaluated in Section 4.D, Cultural Resources (Historic Architectural Resources), pp. 4.D.33-4.D.115, and land use compatibility is addressed in Section 4.B, Land Use and Land Use Planning, pp. 4.B.24-4.B.28.

Transportation and Circulation: Comments raised issues concerning the Proposed Project's connectivity with the rest of San Francisco, particularly by way of 20th and 22nd streets; traffic and pedestrian safety impacts, specifically at the Illinois Parcels; traffic conflicts between the Proposed Project and the trucking route along Illinois Street, as well as noise, air quality, and pedestrian safety impacts created by trucks; the Transportation Impact Study prepared for the EIR; a Transportation Demand Management Plan that would reduce vehicle trips; mitigation measures to be included in the EIR; transportation impact fees; and consistency with the Waterfront Transportation Assessment.

The Proposed Project's Transportation Demand Management Plan is described in Chapter 2, Project Description, on pp. 2.51. The proposed roadway network is also described in Chapter 2 on pp. 2.49-2.50. Section 4.E, Transportation and Circulation, addresses applicable regulatory compliance, and the construction and operation impacts that the Proposed Project's transportation and land use changes would have on traffic, transit, pedestrian, and circulation conditions. Section 4.E summarizes the information in the Transportation Impact Study prepared for the Proposed Project. Mitigation measures are presented as part of the impact evaluation in Section 4.E. Proposed roadway improvements are discussed in Chapter 2 on pp. 2.49-2.50, and analyzed in Section 4.E, pp. 4.E.84-4.E.126. The Proposed Project's noise and air quality impacts are analyzed in Section 4.F, Noise and Vibration, and Section 4.G, Air Quality, respectively.

Noise: A comment asserted that the EIR should evaluate the noise impacts from nearby industrial uses (e.g., BAE Systems Ship Repair facility, the Pacific Gas and Electric Company (PG&E) Potrero Substation, and American Industrial Center) on future residents and employees. Section 4.F, Noise, describes the existing noise environment in the project area and evaluates the potential noise impacts on future residents and employees.

Air Quality: A comment asserted that the EIR should evaluate the air quality and odor impacts from nearby industrial uses on future residents and employees. Section 4.G, Air Quality, discusses the existing air quality conditions in the project area and evaluates the Proposed Project's potential air quality impacts during construction and operation. The section includes an assessment of potential odor impacts.

Hazards and Hazardous Materials: Comments raised concerns about serpentine soils, potential soil/groundwater contamination from underground tanks, and contaminated soil from past industrial uses on the project site, and the risks to future residents and employees. One comment recommended that a full environmental remediation of the project site be considered, in accordance with Proposition D. Existing conditions at the project site and impacts of the Proposed Project in regard to hazards and hazardous materials are described in Section 4.P, Hazards and Hazardous Materials.

Recreation: A comment stated that the EIR should consider the Bay Area Water Trail, and that storage, access, and landing areas remain available for non-motorized small watercraft (e.g., kayaks and canoes) who wish to use San Francisco Bay. The *Enhanced Water Trail Plan* is discussed in Section 4.J, Recreation, pp. 4.J.20.

Utilities: Comments raised issues concerning the need for the EIR to include a discussion of City of San Francisco Ordinances regarding irrigation, use of non-potable water during construction, and water efficiency; stormwater management requirements and system configuration; the proposed recycled water system; updates to the Water Supply Assessment; and the design of proposed utility systems, including the water distribution, wastewater, stormwater, and sewer/storm drain systems. The utilities and service system design for the Proposed Project is described in Chapter 2, Project Description, pp. 2.55-2.67. Section 4.K, Utilities and Service Systems, addresses the potential effects of the Proposed Project on existing public utilities and service systems, including water supply, wastewater, and stormwater, as well as applicable regulatory compliance and the design of proposed systems.

Cumulative Impacts: A comment noted several projects that should be considered in the cumulative analysis, including the adjacent PG&E Site (potential for redevelopment), water taxis, a second BART tunnel, and any other miscellaneous projects in the adjacent Dogpatch neighborhood. Applicable cumulative projects considered in the EIR are presented in Section 4.A, Introduction to Chapter 4, pp. 4.A.12-4.A.18, and analyzed in applicable sections throughout Chapter 4, Environmental Setting and Impacts.

Alternatives: Comments suggested two alternatives to be considered in the EIR: a Reduced Parking Alternative and a Maximum Housing Alternative. EIR Chapter 7, Alternatives, presents and analyzes a reasonable range of feasible alternatives to the Proposed Project. Alternatives are presented and analyzed in this EIR for the purpose of fostering informed decision-making by presenting a range of alternatives that could lessen the significant and less-than-significant impacts identified for the Proposed Project while feasibly attaining most of the basic project objectives.

General: A comment stated that the EIR should incorporate factual, direct statements as opposed to vague terminology. Terms are defined in text or in footnotes in each of the chapters. A list of acronyms and abbreviations used in the EIR is presented on pp. x-xiii.

Draft Environmental Impact Report

This Draft EIR has been prepared in accordance with CEQA and the CEQA Guidelines. It provides an analysis of the project-specific physical environmental impacts of construction and operation of the Proposed Project, and the project's contribution to the environmental impacts from foreseeable cumulative development in the project site vicinity and the City as a whole.

Copies of the Draft EIR are available at the Planning Information Counter, San Francisco Planning Department, 1660 Mission Street, 1st Floor, San Francisco, CA 94103. The Draft EIR is also available for viewing or downloading at the Planning Department website, http://tinyurl.com/sfceqadocs, by choosing the link for Negative Declarations and EIRs under "Current Documents for Public Review" and searching for Case File No. 2014-001272ENV. You may also request that a copy be sent to you by calling (415) 575-9041 or emailing the EIR Coordinator, Melinda Hue, at melinda.hue@sfgov.org.

All documents referenced in this Draft EIR, and the distribution list for the Draft EIR, are available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103, as part of Case File No. 2014-001272ENV.

How to Comment on the Draft Environmental Impact Report

This Draft EIR was published on December 21, 2016. There will be a public hearing before the Planning Commission during the 60-day public review and comment period for this EIR to solicit public comment on the adequacy and accuracy of information presented in this Draft EIR. The public comment period for this EIR is December 22, 2016, to February 21, 2017. The public hearing on this Draft EIR has been scheduled before the Planning Commission for February 9, 2017, in Room 400, City Hall, 1 Dr. Carlton B. Goodlett Place beginning at 10:00 a.m. or later. Please call (415) 558-6422 the week of the hearing for a recorded message giving a more specific time. In addition, during the public review and comment period, members of the public are invited to submit written comments on the adequacy of the document, that is, whether this Draft EIR identifies and analyzes the possible environmental impacts and identifies appropriate mitigation measures.

Written comments should be submitted to:

Lisa Gibson, Acting Environmental Review Officer
Re: Pier 70 Mixed-Use District Project Draft EIR
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Comments may also be submitted by email to lisa.gibson@sfgov.org. Comments must be received by 5:00 p.m. on February 21, 2017.

Commenters are not required to provide personal identifying information. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the Planning Department's website or in other public documents.

Only commenters on the Draft EIR will be permitted to file an appeal of the certification of the Final EIR to the Board of Supervisors.

Final Environmental Impact Report

Following the close of the Draft EIR public review and comment period, the Planning Department will prepare and publish a document entitled "Responses to Comments," which will contain a copy of all comments on this Draft EIR and the City's responses to those comments and any necessary changes to the text, along with copies of the letters received and a transcript of the Planning Commission public hearing on the Draft EIR. This Draft EIR, together with the Responses to Comments document, will be considered by the Planning Commission in an advertised public meeting, and then certified as a Final EIR, if deemed adequate.

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This EIR is organized into eight chapters, as described below.

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- J. Recreation
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Each topic section presents the environmental setting; regulatory framework; approach to analysis; project features that are relevant to the topic; project-specific and cumulative impacts; and mitigation measures and improvement measures, when appropriate.

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Chapter 6, Project Variants, presents one proposed construction-related and three proposed operational-related variants on infrastructure features of the Proposed Project that focus on sustainability. The variants modify one limited feature or aspect of the Proposed Project. The four variants considered are a Reduced Off-Haul Variant, a District Energy System Variant, a Wastewater Treatment and Reuse System Variant, and an Automated Waste Collection System Variant.

Chapter 7, Alternatives, presents and analyzes a range of alternatives to the Proposed Project. Three alternatives are described and evaluated: a No Project Alternative, which is required by CEQA; a Code Compliant Alternative; and a 2010 Pier 70 Master Plan Alternative. This chapter also identifies the environmentally superior alternative. It discusses any alternatives that were considered for analysis in the EIR but rejected, and gives the reasons for their rejection.

Chapter 8, Report Preparers, identifies the EIR authors and the agencies, organizations, and individuals consulted during preparation of the Draft EIR. In addition, the project sponsors, their attorneys, and any consultants working on their behalf are listed.

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- Appendix E: Biological Resources
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1. INTRODUCTION

Chapter 1, Introduction, presents a summary of the Pier 70 Mixed-Use District Project, outlines the purpose of this Environmental Impact Report (EIR), summarizes the environmental review process, and describes the organization of the EIR.

A. PROJECT SUMMARY

The Pier 70 area (Pier 70) encompasses approximately 69 acres of historic shipyard property along San Francisco's Central Waterfront. Most of Pier 70 is listed on the National Register of Historic Places as the Union Iron Works Historic District (UIW Historic District or Historic District). Pier 70 is owned by the City and County of San Francisco through the Port of San Francisco (Port). The Port intends to rehabilitate and redevelop Pier 70, and has selected Forest City Development California, Inc. (Forest City) to act as master developer for 28 acres of the Pier 70 site, and initiate rezoning and development of design standards and controls for a multi-phased, mixed-use development on that site and two adjacent parcels. Together, the Port and Forest City are the project sponsors for the Pier 70 Mixed-Use District Project (Proposed Project).

The project site is an approximately 35-acre area bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. The site is divided into two development areas, the 28-Acre Site and the Illinois Parcels (the 20th/Illinois Parcel and the Hoedown Yard), which contain approximately 351,800 gross square feet (gsf) of deteriorating buildings and facilities. The majority of the project site is located within the UIW Historic District. The 28-Acre Site includes 12 of the 44 contributing historic resources and one of the ten non-contributing resources to the Historic District. All current uses on the site are temporary.

The Proposed Project would include market-rate and affordable residential uses, commercial use, retail/arts/light-industrial (RALI) uses, parking, shoreline improvements, infrastructure development and street improvements, and public open space. Project implementation would require amendments to the *San Francisco General Plan* and San Francisco Planning Code, adding a new Pier 70 Special Use District (SUD), changes to the Zoning Maps, and Planning Code text amendments to modify existing height limits and amendments to the Port's *Waterfront Land Use Plan*. The land use program under the SUD would be flexible, allowing for the development of certain parcels with either primarily commercial-office or residential uses, or, for two parcels on the project site (Parcels C1 and C2), structured parking. The Proposed Project would be implemented in up to five phases and would encompass between 4,179,300 to 4,212,230 gsf of new and rehabilitated development at build-out. Three contributing features to the UIW Historic District on the 28-Acre Site would be rehabilitated, consistent with the

Secretary of Interior's Standards for Treatment of Historic Properties, and adaptively reused. The Proposed Project would demolish seven contributing sheds, structures, and features on the site.[1]

B. PURPOSE OF THIS ENVIRONMENTAL IMPACT REPORT

This EIR has been prepared by the San Francisco Planning Department (Planning Department) in the City and County of San Francisco, the Lead Agency for the Proposed Project, in compliance with the provisions of the California Environmental Quality Act (CEQA) and the CEQA Guidelines (California Public Resources Code Section 21000 et seq., and California Code of Regulations Title 14, Section 15000 et seq., "CEQA Guidelines"), and Chapter 31 of the San Francisco Administrative Code. The lead agency is the public agency that has the principal responsibility for carrying out or approving a project.

Pursuant to CEQA Guidelines Section 15161, this is a project-level EIR, defined as an EIR that examines the physical environmental impacts of a specific development project. This EIR assesses potentially significant impacts in the areas of land use and land use planning, population and housing, cultural resources (archeological resources and historic architectural resources), transportation and circulation, noise and vibration, air quality, greenhouse gas emissions, wind and shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral and energy resources, and agriculture and forest resources. As defined in CEQA Guidelines Section 15382, a "significant effect on the environment" is:

> . . . a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

On September 27, 2013, Governor Brown signed Senate Bill (SB) 743, which became effective on January 1, 2014. Among other things, SB 743 added Section 21099 to the California Public Resources Code, which removes requirements for the analysis of aesthetics and parking impacts for certain urban infill projects from CEQA. The Proposed Project meets the definition of a mixed-use residential project on an infill site located within a transit priority area as specified by California Public Resources Code Section 21099.[2] Accordingly, this EIR does not contain a

[1] An additional building located on the project site, Building 117, is proposed by the Port to be demolished prior to approval of the Proposed Project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code. San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

[2] San Francisco Planning Department, *Transit-Oriented Infill Project Eligibility Checklist*, Pier 70 Mixed Use Project, Case No. 2014-001272ENV, dated November 18, 2015.

separate discussion of the topic of aesthetics, which can no longer be considered in determining the Proposed Project's physical environmental effects under CEQA. The EIR nonetheless provides visual simulations for informational purposes as part of Chapter 2, Project Description. In addition, parking is discussed for informational purposes in Section 4.C, Transportation and Circulation. (See Section 4.A, Introduction to Chapter 4, pp. 4.A.3-4.A.5, for further discussion of SB 743 and California Public Resources Code Section 21099.)

This EIR assesses potentially significant impacts of the Proposed Project. As stated in CEQA Guidelines Section 15121(a), an EIR is an informational document intended to inform public agency decision-makers and the public of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. CEQA requires that public agencies not approve projects until all feasible means available have been employed to substantially lessen the significant environmental effects of such projects.

Before any discretionary project approvals may be granted for the Proposed Project, the San Francisco Planning Commission (Planning Commission) must certify the EIR as adequate, accurate, and objective. EIR adequacy is defined in CEQA Guidelines Section 15151, Standards for Adequacy of an EIR, which states:

> An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

The degree of specificity required in an EIR should "correspond to the degree of specificity involved in the underlying activity which is described in the EIR" (CEQA Guidelines Section 15146).

City decision-makers will use the certified EIR, along with other information and public processes, to determine whether to approve, modify, or disapprove the Proposed Project, and to require any feasible mitigation measures as conditions of project approval.

C. ENVIRONMENTAL REVIEW PROCESS

On November 5, 2014, the project sponsors, the Port and Forest City, submitted an Environmental Evaluation Application for the Pier 70 Mixed-Use District Project to the Planning

Department.[3] The environmental review process for the Proposed Project includes a number of steps: publication and circulation for public comment of a Notice of Preparation (NOP), publication of a Draft EIR for public review and comment, preparation and publication of responses to public and agency comments on the Draft EIR, and certification of the Final EIR. These steps are described below.

Notice of Preparation

The Planning Department published an NOP of an EIR on May 6, 2015, announcing its intent to prepare and distribute an EIR on the Pier 70 Mixed-Use District Project (Appendix A to this EIR).

PUBLIC REVIEW OF AND COMMENTS ON THE NOTICE OF PREPARATION

Publication of the NOP initiated a 30-day public review and comment period that ended on June 5, 2015. Pursuant to the California Public Resources Code Section 21083.9 and CEQA Guidelines Section 15206, a public scoping meeting was held on May 28, 2015, to receive oral comments concerning the scope of the EIR. Four commenters spoke at the meeting. In addition to these comments, the Planning Department received five comment letters from interested parties during the public review and comment period. The comment letters received in response to the NOP and a copy of the transcript from the public scoping meeting are available for review at the Planning Department offices as part of Case File No. 2014-001272ENV. The Planning Department has considered the comments made by the public in preparation of the Draft EIR for the Proposed Project. Comments on the NOP that relate to environmental issues are summarized below and are addressed in this EIR, as noted.

Comments on the NOP raised the following issues:

Plans and Policies: Comments raised issues concerning the need for the EIR to evaluate conflicts between the Proposed Project and the goals of the *Central Waterfront Area Plan*. The Proposed Project's compatibility with applicable plans and policies is discussed in Chapter 3, Plans and Policies.

Land Use and Land Use Planning: A comment noted that the EIR should evaluate physical land use impacts from the Proposed Project and other past, present, and reasonably foreseeable projects. Project-specific and cumulative land use impacts are discussed in Section 4.B, Land Use and Land Use Planning, pp. 4.B.17-4.B.28.

[3] Environmental Evaluation Application for the Pier 70 Mixed-Use District Project, dated November 5, 2014.

Cultural Resources: Comments raised issues concerning impacts of the Proposed Project on the historic and existing industrial land uses of the area. The Proposed Project's impacts on historical resources are evaluated in Section 4.D, Cultural Resources (Historic Architectural Resources), pp. 4.D.33-4.D.115, and land use compatibility is addressed in Section 4.B, Land Use and Land Use Planning, pp. 4.B.24-4.B.28.

Transportation and Circulation: Comments raised issues concerning the Proposed Project's connectivity with the rest of San Francisco, particularly by way of 20th and 22nd streets; traffic and pedestrian safety impacts, specifically at the Illinois Parcels; traffic conflicts between the Proposed Project and the trucking route along Illinois Street, as well as noise, air quality, and pedestrian safety impacts created by trucks; the Transportation Impact Study prepared for the EIR; a Transportation Demand Management Plan that would reduce vehicle trips; mitigation measures to be included in the EIR; transportation impact fees; and consistency with the Waterfront Transportation Assessment.

The Proposed Project's Transportation Demand Management Plan is described in Chapter 2, Project Description, on pp. 2.51. The proposed roadway network is also described in Chapter 2 on pp. 2.49-2.50. Section 4.E, Transportation and Circulation, addresses applicable regulatory compliance, and the construction and operation impacts that the Proposed Project's transportation and land use changes would have on traffic, transit, pedestrian, and circulation conditions. Section 4.E summarizes the information in the Transportation Impact Study prepared for the Proposed Project. Mitigation measures are presented as part of the impact evaluation in Section 4.E. Proposed roadway improvements are discussed in Chapter 2 on pp. 2.49-2.50, and analyzed in Section 4.E, pp. 4.E.84-4.E.126. The Proposed Project's noise and air quality impacts are analyzed in Section 4.F, Noise and Vibration, and Section 4.G, Air Quality, respectively.

Noise: A comment asserted that the EIR should evaluate the noise impacts from nearby industrial uses (e.g., BAE Systems Ship Repair facility, the Pacific Gas and Electric Company (PG&E) Potrero Substation, and American Industrial Center) on future residents and employees. Section 4.F, Noise, describes the existing noise environment in the project area and evaluates the potential noise impacts on future residents and employees.

Air Quality: A comment asserted that the EIR should evaluate the air quality and odor impacts from nearby industrial uses on future residents and employees. Section 4.G, Air Quality, discusses the existing air quality conditions in the project area and evaluates the Proposed Project's potential air quality impacts during construction and operation. The section includes an assessment of potential odor impacts.

Hazards and Hazardous Materials: Comments raised concerns about serpentine soils, potential soil/groundwater contamination from underground tanks, and contaminated soil from past industrial uses on the project site, and the risks to future residents and employees. One comment recommended that a full environmental remediation of the project site be considered, in accordance with Proposition D. Existing conditions at the project site and impacts of the Proposed Project in regard to hazards and hazardous materials are described in Section 4.P, Hazards and Hazardous Materials.

Recreation: A comment stated that the EIR should consider the Bay Area Water Trail, and that storage, access, and landing areas remain available for non-motorized small watercraft (e.g., kayaks and canoes) who wish to use San Francisco Bay. The *Enhanced Water Trail Plan* is discussed in Section 4.J, Recreation, pp. 4.J.20.

Utilities: Comments raised issues concerning the need for the EIR to include a discussion of City of San Francisco Ordinances regarding irrigation, use of non-potable water during construction, and water efficiency; stormwater management requirements and system configuration; the proposed recycled water system; updates to the Water Supply Assessment; and the design of proposed utility systems, including the water distribution, wastewater, stormwater, and sewer/storm drain systems. The utilities and service system design for the Proposed Project is described in Chapter 2, Project Description, pp. 2.55-2.67. Section 4.K, Utilities and Service Systems, addresses the potential effects of the Proposed Project on existing public utilities and service systems, including water supply, wastewater, and stormwater, as well as applicable regulatory compliance and the design of proposed systems.

Cumulative Impacts: A comment noted several projects that should be considered in the cumulative analysis, including the adjacent PG&E Site (potential for redevelopment), water taxis, a second BART tunnel, and any other miscellaneous projects in the adjacent Dogpatch neighborhood. Applicable cumulative projects considered in the EIR are presented in Section 4.A, Introduction to Chapter 4, pp. 4.A.12-4.A.18, and analyzed in applicable sections throughout Chapter 4, Environmental Setting and Impacts.

Alternatives: Comments suggested two alternatives to be considered in the EIR: a Reduced Parking Alternative and a Maximum Housing Alternative. EIR Chapter 7, Alternatives, presents and analyzes a reasonable range of feasible alternatives to the Proposed Project. Alternatives are presented and analyzed in this EIR for the purpose of fostering informed decision-making by presenting a range of alternatives that could lessen the significant and less-than-significant impacts identified for the Proposed Project while feasibly attaining most of the basic project objectives.

General: A comment stated that the EIR should incorporate factual, direct statements as opposed to vague terminology. Terms are defined in text or in footnotes in each of the chapters. A list of acronyms and abbreviations used in the EIR is presented on pp. x-xiii.

Draft Environmental Impact Report

This Draft EIR has been prepared in accordance with CEQA and the CEQA Guidelines. It provides an analysis of the project-specific physical environmental impacts of construction and operation of the Proposed Project, and the project's contribution to the environmental impacts from foreseeable cumulative development in the project site vicinity and the City as a whole.

Copies of the Draft EIR are available at the Planning Information Counter, San Francisco Planning Department, 1660 Mission Street, 1st Floor, San Francisco, CA 94103. The Draft EIR is also available for viewing or downloading at the Planning Department website, http://tinyurl.com/sfceqadocs, by choosing the link for Negative Declarations and EIRs under "Current Documents for Public Review" and searching for Case File No. 2014-001272ENV. You may also request that a copy be sent to you by calling (415) 575-9041 or emailing the EIR Coordinator, Melinda Hue, at melinda.hue@sfgov.org.

All documents referenced in this Draft EIR, and the distribution list for the Draft EIR, are available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103, as part of Case File No. 2014-001272ENV.

How to Comment on the Draft Environmental Impact Report

This Draft EIR was published on December 21, 2016. There will be a public hearing before the Planning Commission during the 60-day public review and comment period for this EIR to solicit public comment on the adequacy and accuracy of information presented in this Draft EIR. The public comment period for this EIR is December 22, 2016, to February 21, 2017. The public hearing on this Draft EIR has been scheduled before the Planning Commission for February 9, 2017, in Room 400, City Hall, 1 Dr. Carlton B. Goodlett Place beginning at 10:00 a.m. or later. Please call (415) 558-6422 the week of the hearing for a recorded message giving a more specific time. In addition, during the public review and comment period, members of the public are invited to submit written comments on the adequacy of the document, that is, whether this Draft EIR identifies and analyzes the possible environmental impacts and identifies appropriate mitigation measures.

Written comments should be submitted to:

Lisa Gibson, Acting Environmental Review Officer
Re: Pier 70 Mixed-Use District Project Draft EIR
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Comments may also be submitted by email to lisa.gibson@sfgov.org. Comments must be received by 5:00 p.m. on February 21, 2017.

Commenters are not required to provide personal identifying information. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the Planning Department's website or in other public documents.

Only commenters on the Draft EIR will be permitted to file an appeal of the certification of the Final EIR to the Board of Supervisors.

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2. PROJECT DESCRIPTION

A. PROJECT OVERVIEW

The Pier 70 area (Pier 70) encompasses 69 acres of historic shipyard property along San Francisco's Central Waterfront. Under the Burton Act, Pier 70 is owned by the City and County of San Francisco (City) through the Port Commission of San Francisco (Port or Port Commission).[1] The Port intends to rehabilitate and redevelop Pier 70, and has selected Forest City Development California, Inc. (Forest City) to act as master developer for 28 acres of the site. Forest City will initiate rezoning and develop design standards and controls for a multi-phased, mixed-use development on that site and two adjacent parcels.[2] (See Figure 2.2: Existing Site Plan, p. 2.11.) As envisioned, the proposed Pier 70 Mixed-Use District Project (Proposed Project) would include phased development of market-rate and affordable residential uses, commercial use, retail/arts/light-industrial (RALI) uses,[3] parking, shoreline improvements, infrastructure development and street improvements, and public open space. Together, the Port and Forest City are the project sponsors for the Proposed Project.

The proposed Pier 70 Mixed-Use District Project, for which this project-level Environmental Impact Report (EIR) has been prepared, comprises a project site of an approximately 35-acre area bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. The project site is south of Mission Bay, east of the Potrero Hill and Dogpatch[4] neighborhoods, and within the northeastern portion of San Francisco's *Central Waterfront Area Plan*, one of four areas covered by the *Eastern Neighborhoods Rezoning and Area Plan (Eastern Neighborhoods Area Plan).* The project site is located within Pier 70, except

[1] The Burton Act (Chapter 1333 of the Statutes of 1968) was adopted by the California Legislature in 1968. Under the Burton Act and the companion Burton Act transfer agreement, the State transferred ownership of the tidelands making up San Francisco harbor to the City, with the requirement that the City form a Port Commission with complete authority to use, operate, manage and regulate the granted lands.

[2] The Port and Forest City entered into an Exclusive Negotiating Agreement in July 2011, as authorized by Port Commission Resolution No. 11-49. The Port Commission subsequently endorsed a Term Sheet outlining features of the Proposed Project, which the San Francisco Board of Supervisors endorsed in June 2013 by Resolution No. 201-13.

[3] The project sponsors describe the RALI use as including neighborhood retail, arts, eating and drinking places, production distribution and repair, light manufacturing, and entertainment establishments, which are collectively referred to for the purposes of this EIR as RALI uses.

[4] The Dogpatch neighborhood is bounded by Mariposa Street to the north, I-280 to the west, Cesar Chavez Street to the south, and Illinois Street to the east.

for a 3.6-acre parcel adjacent to Pier 70's southwest corner, known as the Hoedown Yard, which is owned by Pacific Gas and Electric Company (PG&E). [5]

The project site contains two development areas. The "28-Acre Site" is an approximately 28-acre area located between 20th, Michigan, and 22nd streets, and San Francisco Bay. This site includes Assessor's Block 4052/Lot 001 and Lot 002 and Block 4111/Lot 003 and Lot 004. The "Illinois Parcels" form an approximately 7-acre site that consists of an approximately 3.4-acre Port-owned parcel, called the "20th/Illinois Parcel," along Illinois Street at 20th Street (Assessor's Block 4110/Lot 001) and the approximately 3.6-acre "Hoedown Yard," at Illinois and 22nd streets (Assessor's Block 4120/Lot 002 and Block 4110/Lot 008A), which is owned by PG&E. The Hoedown Yard includes a City-owned 0.2-acre portion of street right-of-way that bisects the site.[6]

The Proposed Project would amend the *San Francisco General Plan* (*General Plan*) and Planning Code, adding a new Pier 70 Special Use District (SUD). The SUD would establish land use zoning controls for the project site, and incorporate the design standards and guidelines for all new construction at the project site as set forth in the proposed *Pier 70 SUD Design for Development* document (*Design for Development*).[7] The Zoning Maps would be amended to show changes from the current zoning (M-2 [Heavy Industrial] and P [Public]) to the proposed SUD zoning. Height limits on the 28-Acre Site would be increased from 40 to 90 feet, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet, as authorized by Proposition F in November 2014. The Planning Code text amendments would also modify the existing height limits on an eastern portion of the Hoedown Yard from 40 to 65 feet. Height limits are further restricted through the design standards established in the proposed *Pier 70 SUD Design for Development*. The Proposed Project would also amend the Port's *Waterfront Land Use Plan* (WLUP).

Under the proposed SUD, the Proposed Project would provide a phased mixed-use land use program in which certain parcels could be developed with either primarily commercial uses or residential uses, with much of the ground floor dedicated to RALI uses. In addition, two parcels

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[5] Under an option agreement with PG&E, the City has an option to purchase the Hoedown Yard. PG&E has consented to including the Hoedown Yard in the project sponsors' rezoning efforts; however, the City would not exercise its option to purchase the Hoedown Yard and development of this parcel would not proceed, unless PG&E locates a suitable relocation site for the current utility operations at the Hoedown Yard. PG&E's consent is reflected in the letter from Kendrick Li, Supervisor Land Acquisition Development, PG&E, to Brad Benson, Port of San Francisco, regarding the Hoedown Yard, June 6, 2014. The environmental analysis assumes that the City will exercise its option with PG&E, and will subsequently purchase the Hoedown Yard.

[6] The 0.2-acre Michigan Street right-of-way is a recorded easement; however, no physical roadway exists.

[7] The proposed *Pier 70 Design for Development* document, which is included as part of the Proposed Project, would set forth the underlying vision and principles for development of the project site, and establish implementing standards and design guidelines.

on the project site (Parcels C1 and C2) could be developed for structured parking, residential/commercial use, or solely residential use, depending on future market demand for parking and future travel demand patterns. Development of the 28-Acre Site would include up to a maximum of approximately 3,422,265 gross square feet (gsf) of construction in new buildings and improvements to existing structures (excluding square footage allocated to accessory parking[8]). New buildings would have maximum heights of 50 to 90 feet. Development of the Illinois Parcels would include up to a maximum of approximately 801,400 gsf in new buildings; these new buildings would not exceed a height of 65 feet, which is the existing height limit along Illinois Street on both the Port-owned and the western portion of the Hoedown Yard.

The Union Iron Works Historic District (Historic District) is listed in the National Register of Historic Places (National Register) in recognition of Pier 70's role in the development of steel shipbuilding in the United States and for industrial architecture built at the site between 1884 and the end of World War II. The majority of the project site is within the Historic District. The 28-Acre Site contains 12 of the 44 contributing buildings/structures/features (collectively "contributing features") of the Historic District and one of the ten non-contributing features. With implementation of the Proposed Project, three contributing features (Buildings 2, 12, and 21) would be rehabilitated in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and adapted for reuse; one landscape feature (the existing remnant of Irish Hill[9]) would be mostly retained; and seven structures and sheds (Buildings 11, 15, 16, 19, 25, 32, and 66), containing 92,945 gsf, would be demolished. The Port has proposed to demolish the 30,940-gsf Building 117, located on the project site, prior to approval of the Proposed Project.[10] The single non-contributing feature on the project site (Slipways 5 through 8, which are currently covered by fill and asphalt) would be partially demolished.

The Proposed Project includes transportation and circulation improvements, new and upgraded utilities and infrastructure, geotechnical and shoreline improvements, and 9 acres of public open space. Three options for sewer/wastewater treatment, three options for grading around Building 12, and an option for pedestrian passageways are evaluated in this EIR. The Proposed Project also includes four variants that consider modifications to the proposed infrastructure and building systems to enhance sustainability.

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[8] All proposed parking is considered accessory, excluding those parking spaces within the C1 and/or C2 parking garages. Parking spaces within the two parking garages are considered principal use.

[9] Today, approximately 1.4 acres remain from the original 20.6 acres of Irish Hill.

[10] Building 117 is proposed for demolition as part of the 20th Street Historic Core project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code. The Port filed an application to demolish Building 117 on January 7, 2016, Case No. 2016-000346ENV. Any approval of the demolition of Building 117 will undergo appropriate environmental review, as required by CEQA. San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

B. PROJECT SPONSORS' OBJECTIVES

The Port and Forest City seek to achieve the following objectives by undertaking the Proposed Project:

- Create a unique San Francisco neighborhood within an industrial historic district that includes new, activated waterfront open spaces with the amenities and services necessary to support a diverse, thriving community of residents and workers, while addressing potential land use conflicts with ongoing ship repair at Pier 70.
- Implement the open space, housing, affordability, historic rehabilitation, artist community preservation, commercial, waterfront height limit and urban design policies endorsed by the voters in Proposition F for the 28-Acre Site (November 2014).
- Provide dense, mixed-income housing that includes both ownership and rental opportunities, to attract a diversity of household types in order to help San Francisco meet its fair share of regional housing needs.
- Provide a model of 21st century sustainable urban development by implementing the *Pier 70 Risk Management Plan* approved by the San Francisco Bay Regional Water Quality Control Board; encouraging energy and water conservation systems; and reducing vehicle usage, emissions, and vehicle miles traveled to reduce the carbon footprint impacts of new development, consistent with the Port's *Climate Action Plan*.
- Provide access to San Francisco Bay where it has been historically precluded, by opening the eastern shore of the site to the public with a major new waterfront park, extending the Bay Trail, and establishing the Blue Greenway, and create a pedestrian- and bicycle-friendly environment.
- Rehabilitate three contributors to the Union Iron Works Historic District to accommodate new uses consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties, and design and build new infrastructure, public realm areas, parks and buildings consistent with the Infill Development Design Criteria within the Port's *Pier 70 Preferred Master Plan* and support the continued integrity of the Union Iron Works Historic District.
- Create business and employment opportunities for local workers and businesses during the design, construction, and operation phases of the Proposed Project.
- Elevate and reinforce site infrastructure and building parcels to allow the new Pier 70 neighborhood to be resilient to projected levels of sea level rise and any major seismic event, as well as incorporate financing strategies that enable the project and the Port's Bay shoreline to adapt to future, increased levels of sea level rise.
- Along with the Historic Core and Crane Cove Park, serve as a catalyst project for Pier 70 to support the Port's site-wide goals established in the *Pier 70 Preferred Master Plan*, including new infrastructure, streets and utilities, and new revenue to fund other Pier 70 improvements.
- Construct a high-quality, public-private development project that can attract sources of public investment, equity, and debt financing sufficient to fund the Proposed Project's site and infrastructure costs, fund ongoing maintenance and operation costs, and produce a market rate return investment that meets the requirement of Assembly Bill (AB) 418 (2011) and allows the Port to further its Public Trust mandate and mission.

- Through exercise of the City's option with PG&E to purchase the Hoedown Yard, provide funds for the City's HOPE VI rebuild projects in accordance with Board Resolution No. 54-14, such as the Potrero Terrace and Annex project.

C. PROJECT LOCATION AND SITE CHARACTERISTICS

PROJECT SITE VICINITY

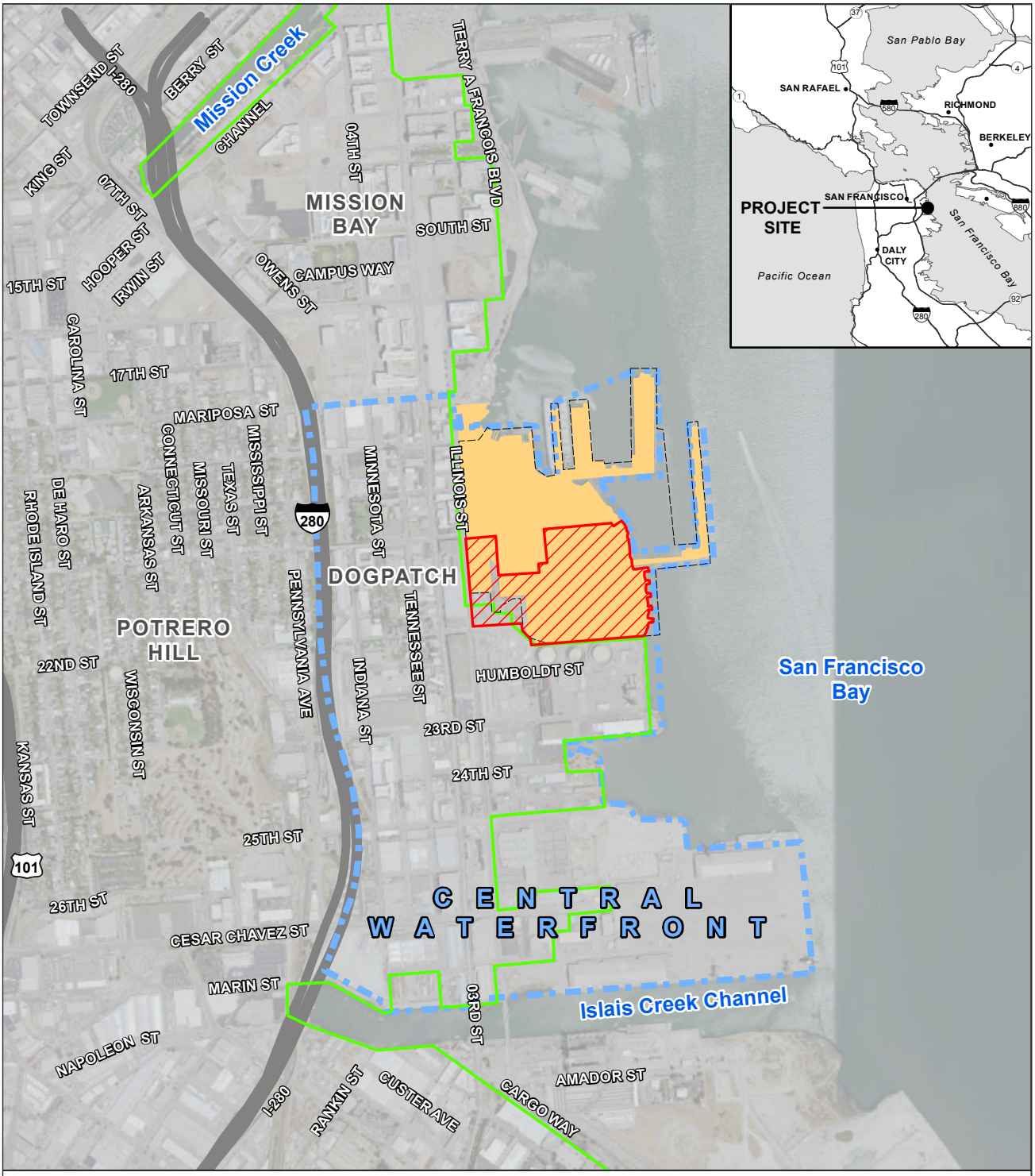
The 35-acre project site is located within the 69-acre Pier 70 area on San Francisco Bay along San Francisco's Central Waterfront, described on p. 2.6. (See Figure 2.1: Project Location.) It is just south of Mission Bay South and east of the Potrero Hill and Dogpatch neighborhoods. The American Industrial Center, a large multi-tenant light-industrial building, is located across Illinois Street, west of the Illinois Parcels. To the north of the project site are the BAE Systems Ship Repair facility, the 20th Street Historic Core (Historic Core) of the Union Iron Works Historic District,[11] future Crane Cove Park (construction of which is scheduled to begin in 2016), and the Mission Bay South redevelopment area. To the south of the project site are PG&E's Potrero Substation (a functioning high-voltage transmission substation serving San Francisco), the decommissioned Potrero Power Plant, and the TransBay Cable converter station, which connects the Pittsburg-San Francisco 400-megawatt direct-current, underwater electric transmission cable to PG&E's electricity transmission grid by way of the Potrero Substation.

Nearby transportation infrastructure includes Third Street, a major arterial[12] located about 300 feet west of the project site; the Caltrain right-of-way and 22nd Street station,[13] located approximately 0.3 mile to the west; and the north-south-running Highways 101 and 280, about 0.5 mile and 0.3 mile west of the project site, respectively. Cesar Chavez Street runs east-west about 0.5 mile to the south of the project site and connects to Highways 101 and 280. Muni's Third Street light rail line has two station stops between 500 to 1,000 feet from the project site, one at Third and 20th streets and the other at Third and 23rd streets. The project site is approximately 0.5 mile from stops for Muni's 22 Fillmore and 48 Quintara/24th Street bus routes. Major bikeways near the project site are Route 5 (Illinois Street), a dedicated north-south bikeway along the waterfront (including The Embarcadero to Bayshore Boulevard); Route 40 (16th and Illinois streets), a dedicated east-west bike lane; Route 7 (Indiana Street), a north-south bike route through the Dogpatch neighborhood; and Route 23 (Mariposa Street), which overlaps with Route 7 along Mariposa Street and turns into a bike lane on Mississippi Street.

[11] The Historic Core is an approximately 7-acre portion of the Union Iron Works Historic District and contains 270,000 gsf of largely vacant industrial and office space currently undergoing rehabilitation for adaptive reuse.

[12] *San Francisco General Plan* Transportation Element, Map 6, Vehicular Street Map.

[13] Caltrain's Fourth and King terminus is about 1.25 miles north of the project site.



Source: City and County of San Francisco, Port of San Francisco

0 Feet 1,500

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.1: PROJECT LOCATION

There is a dilapidated pier extending from the project site into San Francisco Bay immediately northeast of the slipways, but outside of the project site boundary. The pier is constructed of creosote-treated wood and is not structurally sound. There are no alterations planned for this pier, which would remain in place under the Proposed Project. The dilapidated pier is not part of the Proposed Project analyzed in this EIR.

PROJECT SITE DEVELOPMENT BACKGROUND

Pier 70 is owned by the Port and encompasses approximately 69 acres of historic shipyard property along San Francisco's Central Waterfront. Most of Pier 70 (66 of the total 69 acres) is listed in the National Register as the Union Iron Works Historic District, described on pp. 2.9-2.10. Portions of Pier 70 are still used today for ship repair operations, as well as for other industrial operations.

In 1997, the San Francisco Port Commission identified the preservation of Pier 70's ship repair industry and history as key priorities for its WLUP.[14] In 2010, the Port Commission published the *Pier 70 Preferred Master Plan*[15] (*Preferred Master Plan*), stating its vision to "create a vibrant and authentic historic district that re-establishes the historic activity level, activates new waterfront open spaces, creates a center for innovative industries, and integrates ongoing ship repair operations" at Pier 70.[16] The *Preferred Master Plan* also provides a framework for Pier 70 that serves to allocate land to parks, ship repair, historic rehabilitation, and new development sites; establish infill design guidelines to protect the integrity of the Historic District as new development occurs; and prioritize investment in the most significant historic buildings.

COMPETITIVE SOLICITATION AND EXCLUSIVE NEGOTIATION AGREEMENT

The Port intends to rehabilitate or redevelop a portion of Pier 70 in furtherance of the goals identified in the *Preferred Master Plan*. In August 2010, the Port initiated a public solicitation process through a Request for Developer Qualifications to select a private developer partner for the development of the 28-Acre Site. After considering a staff memorandum that evaluated Request for Qualification responses and public comments made at Port Commission hearings, in April 2011 the Port Commission selected Forest City as the master developer to initiate rezoning, develop design standards and controls, and implement development of a multi-phased, mixed-use development on the project site. The parties entered into an Exclusive Negotiating Agreement in

[14] Port of San Francisco, *Waterfront Land Use Plan*, adopted 1997.

[15] Port of San Francisco, *Pier 70 Preferred Master Plan*, April 2010. Available online at http://www.sfport.com/ftp/uploadedfiles/about_us/divisions/planning_development/southern_waterfront/pier70masterplan_intro-overview.pdf, accessed September 24, 2015.

[16] Ibid., p. 1.

July 2011 as authorized by Port Commission Resolution No. 11–49. In compliance with the Exclusive Negotiating Agreement, Forest City conducted community outreach and developed a land use plan for the Proposed Project, drawing on the framework established by the *Preferred Master Plan*.

The Port Commission and the Board of Supervisors endorsed a nonbinding Term Sheet between the Port and Forest City outlining features of the Proposed Project in May and June 2013, respectively. Under the Term Sheet, the Illinois Parcels would be included in the proposed SUD, and Forest City, although it would not have development rights to those parcels, would in a public-private partnership with the Port, and in collaboration with the Office of Economic and Workforce Development and other City agencies, seek entitlements for mixed-use development on both the 28-Acre Site and the Illinois Parcels. Forest City would act as master developer to construct the parks, streets, and infrastructure to support new development on the 28-Acre Site. Forest City would either construct the planned new buildings on the 28-Acre Site or assist the Port in the disposition of property to third-party builders.

PROPOSITION F

On November 4, 2014, the San Francisco electorate approved Proposition F, a ballot measure that authorized a height increase at the 28-Acre Site from the existing 40 to 90 feet, directed that the project proposed on the 28-Acre Site undergo environmental review, and established policies regarding the provision of certain significant public benefits as part of the proposed project at the 28-Acre Site. Proposition F complied with the requirement established by Proposition B (June 2014) for San Francisco voter approval for any proposed height limit increase along the San Francisco waterfront on Port-owned property that would exceed existing height limits in effect on January 1, 2014. Proposition B does not apply to the Hoedown Yard, because the property is not owned by the Port. Proposition F conditioned the effective date of the proposed height increase on completion of an EIR and approval of a development plan for the 28-Acre Site by the Port Commission and Board of Supervisors. Proposition F did not address heights on the Illinois Parcels.

The height increase approved in Proposition F was contingent on the City's later approval of a project at the 28-Acre Site that would include the following:

- Provision of 9 acres of waterfront parks, playgrounds, and recreation opportunities on and adjacent to the 28-Acre Site;
- Construction of between approximately 1,000 and 2,000 new housing units;
- Provision of 30 percent of all new housing units at below-market rates;
- Stipulation that the majority of new housing units be offered for rent;

- Restoration of those historic structures on the site that are essential to the integrity of the Union Iron Works Historic District;
- Creation of substantial new and renovated space for arts, cultural, small-scale manufacturing, local retail, and neighborhood-serving uses;
- Preservation of the artist community currently located in Building 11 (the Noonan Building) by providing new state-of-the-art, on-site space that is affordable, functional and aesthetic, and by continuing to accommodate the Noonan Building community within the Union Iron Works Historic District during any transition period associated with the construction of new space;[17]
- Creation of between approximately 1,000,000 and 2,000,000 square feet of new commercial and office space; and
- Provision of accessory parking facilities and other transportation infrastructure as part of a transportation demand management program that enhances mobility in the district and neighborhood.

UNION IRON WORKS HISTORIC DISTRICT

Most of Pier 70 (66 of the total 69 acres) is listed in the Historic District. The Historic District's National Register nomination report[18] documents the significance of Union Iron Works (UIW) and Bethlehem Steel at Pier 70 and their role in the nation's maritime history, supporting multiple war efforts, as well as in the evolution of industrial architecture in San Francisco. The Historic District's 44 contributing features and 10 non-contributing features include "buildings, piers, slips, cranes, segments of a railroad network, and landscape elements." Most of the buildings are of an industrial architectural style and historic use, and made of "unreinforced brick masonry, concrete, and steel framing, with corrugated iron or steel cladding."[19] Pier 70's contributors to the Historic District are widely recognized as constituting the most intact industrial complex west of the Mississippi that represents the industrialization of the western United States. The Historic District was listed in the National Register in large part because the area "maintains exceptional integrity in terms of location, design, setting, materials, workmanship, feeling, and association."[20] UIW built or repaired ships at Pier 70 from the time of the Spanish American War in 1898, and ship repair operations continue today. The Historic District is not locally designated under Articles 10 or 11 of the San Francisco Planning Code.[21]

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[17] Rents are to be based on the Port's current parameter rent schedule for the Noonan Building inflated to the date the new space is available, and thereafter as outlined in project approval documents.

[18] The Historic District nomination provides a complete account of the history of the site and can be accessed on the Port's website at http://sfport.com/Modules/ShowDocument.aspx?documentID=6608. Accessed September 24, 2015.

[19] Ibid., p. 5.

[20] Ibid., p. 23.

[21] Article 10 of the Planning Code describes Preservation of Historical Architecture and Aesthetic Landmarks, and Article 11 of the Planning Code describes Preservation of Buildings and Districts of Architectural, Historical, and Aesthetic Importance in the C-3 District.

The Historic District is characterized by the following features:

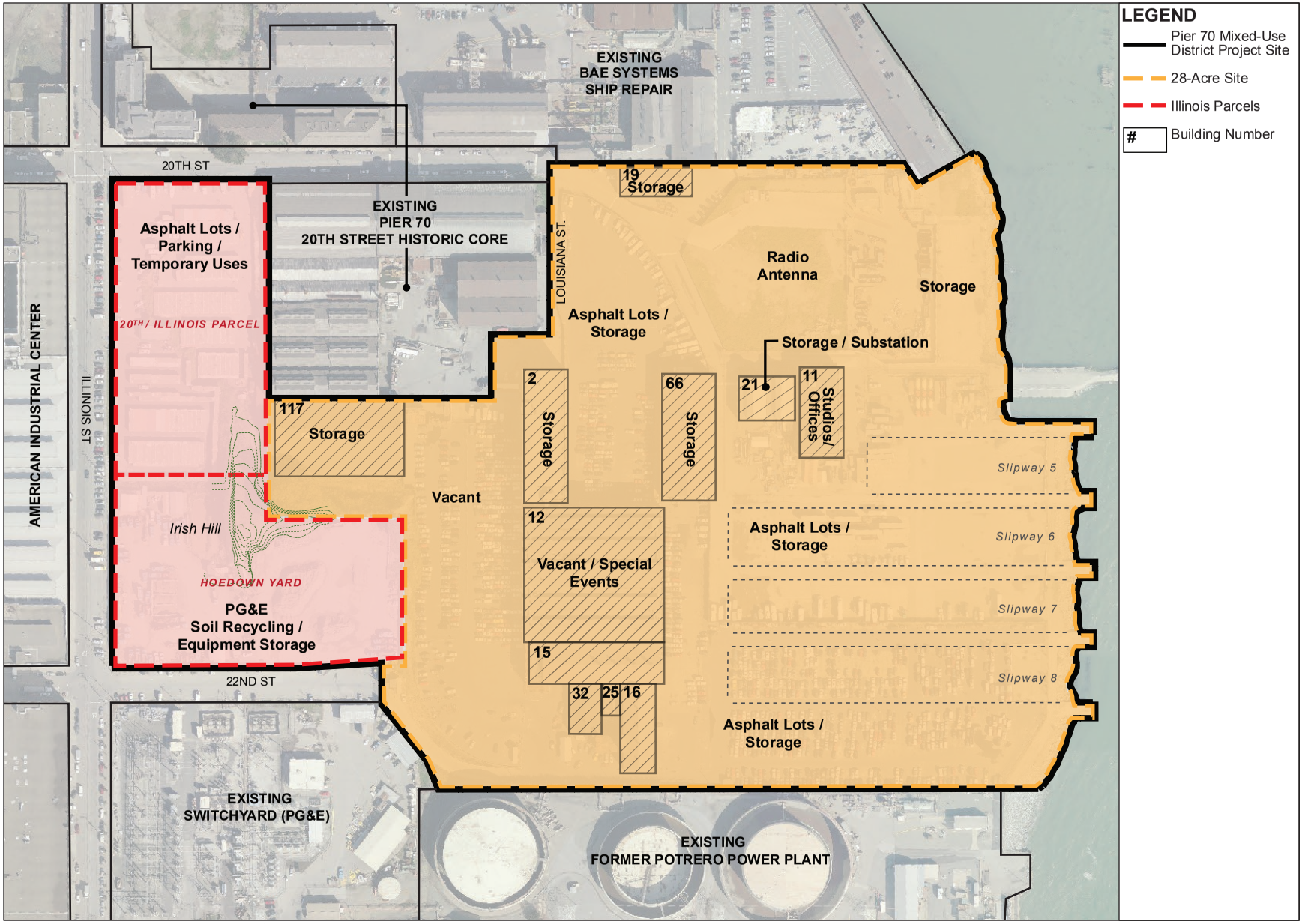
- Waterfront location;
- Numerous contributing features dating from 1884 to 1945;
- Minimal planted vegetation;
- Open areas that are paved or covered with gravel;
- Streets without curbs or gutters (except for 20th Street, which has granite curbs);
- Dense urban industrial character;
- Buildings that vary in scale, from 60,000 to 100,000 square feet and heights from one to six stories (80 feet), as well as a wide range of architectural treatments and materials;
- Unique groupings of buildings, including the unreinforced monumental masonry Buildings 113 and 114, as well as the steel-frame and corrugated-metal World War II Building 12 complex;
- Wharves, piers, slips, cranes and floating drydocks; and
- Ongoing ship repair activity.

The project site contains 12 of the 44 contributing features in the Historic District and one of the ten non-contributing features in the Historic District. The Hoedown Yard is not within the Historic District, but it has also been used for industrial purposes since the 1880s. Identifiable historical uses at the Hoedown Yard appear to have been limited to the storage of fuel oil in above-ground storage tanks (30,000- to 40,000-barrel capacity) for adjacent industrial activities. PG&E acquired the Hoedown Yard over time from various companies, including UIW and Bethlehem Steel. (See Figure 2.2: Existing Site Plan.)

HISTORIC UPLANDS AND TIDELANDS

A portion of the San Francisco Bay shoreline as mapped in 1869 now falls on land areas of the project site, following an undulating pattern east-to-west, then curving south. The 1869 shoreline started south of what is now 20th Street, traversing the project site in the southern direction.[22] Portions of the shoreline were later filled to form the eastern edge of project site and lands to the north.

[22] Treadwell and Rollo, "Environmental Site Investigation Report: Pier 70 Master Plan Area, San Francisco, California," prepared for the Port of San Francisco, January 13, 2011, Figure 4, Current Land Use (PDF p. 309).



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.2: EXISTING SITE PLAN

A substantial portion of the project site has always been upland, meaning that it is located upward of the historical shoreline. The uplands were originally part of the privately owned Rancho del Potrero Nuevo, but title to the rancho was never confirmed and the lands were ultimately confirmed as being within the San Francisco pueblo.[23] The City's Van Ness Ordinance ultimately conveyed title of the pueblo lands to those persons in actual possession.[24]

In the late 1860s, the State authorized tidelands grants in the Pier 70 area to William Alvord and his company (and successor in interest), the Pacific Rolling Mills Company, with a condition requiring that iron production facilities be constructed. In 1900, the Pacific Rolling Mills Company conveyed all of its property in the Pier 70 area to Risdon Iron & Locomotive Works, creating the Risdon Yard.

The uplands, generally east of the north-south-running Georgia Street,[25] were part of the Risdon Yard. The Risdon Yard was transferred to several successive private owners until the U.S. government acquired the yard in 1940, then immediately leased it to Bethlehem Steel in connection with the war effort. The State purchased the Risdon Yard, including the uplands, in 1967, and then conveyed the property to the Port under the 1968 Burton Act grant. Bethlehem Steel held the remainder of the Pier 70 uplands until 1982, when the Port acquired the uplands property, along with former tidelands from Bethlehem Steel, as described below.

The largest portion of the Pier 70 site comprises lands mapped and sold by the Board of Tide Land Commissioners (BTLC). The sales were authorized by Chapter 543 of the Statutes of 1868. That statute directed the BTLC to establish a waterfront line in San Francisco south of Second Street; to reserve lands for streets, docks, piers, slips, canals, drains, and other uses as necessary for the public convenience and for the purposes of commerce; and to auction into private ownership the remaining lands landward of the waterfront line. Most of the BTLC lots were owned by Bethlehem Steel or Risdon Iron & Locomotive Works by the turn of the nineteenth century into the twentieth century.

All of the filled lands north of the Bethlehem Steel property appear to have been reserved from sale by the State, including Illinois Street, portions of 20th and Michigan streets, and the Central Basin. The State conveyed these lands to the City as part of the Burton Act grant.

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[23] The pueblo lands were granted by Mexico and, after extensive litigation, ultimately patented by the United States to the City, resulting in the 1883 Pueblo Line, which represents the land comprising the San Francisco pueblo. The confirmed pueblo line is determinative of the boundary between uplands granted to the City and the sovereign tide and submerged lands of the State at statehood.

[24] Brad Benson, Port of San Francisco, memorandum to Jennifer Luchessi, Executive Director, California State Lands Commission, September 24, 2015.

[25] The north-south-running Georgia Street, which bisects the project site beginning at 20th Street through the Historic Core site and continuing south to 22nd Street, is not a physical street. The northern portion of this roadway was closed in 1884, and the southern portion was closed in 1940.

PROJECT SITE LAND USE RESTRICTIONS

PUBLIC TRUST LANDS

Portions of the 28-Acre Site and Illinois Parcels are subject to the common law tidelands public trust for commerce, navigation, and fisheries and the statutory trust under the Burton Act, as amended (the Public Trust). (See Figure 2.3: Existing Public Trust Lands.) The Public Trust imposes certain use restrictions on historical tidal and submerged lands along the waterfront to protect the interests of the people of the State of California for commerce, navigation, and fisheries, as well as other public benefits recognized to further trust purposes, such as recreation and environmental preservation.[26]

SAN FRANCISCO

Eastern Neighborhoods Area Plan

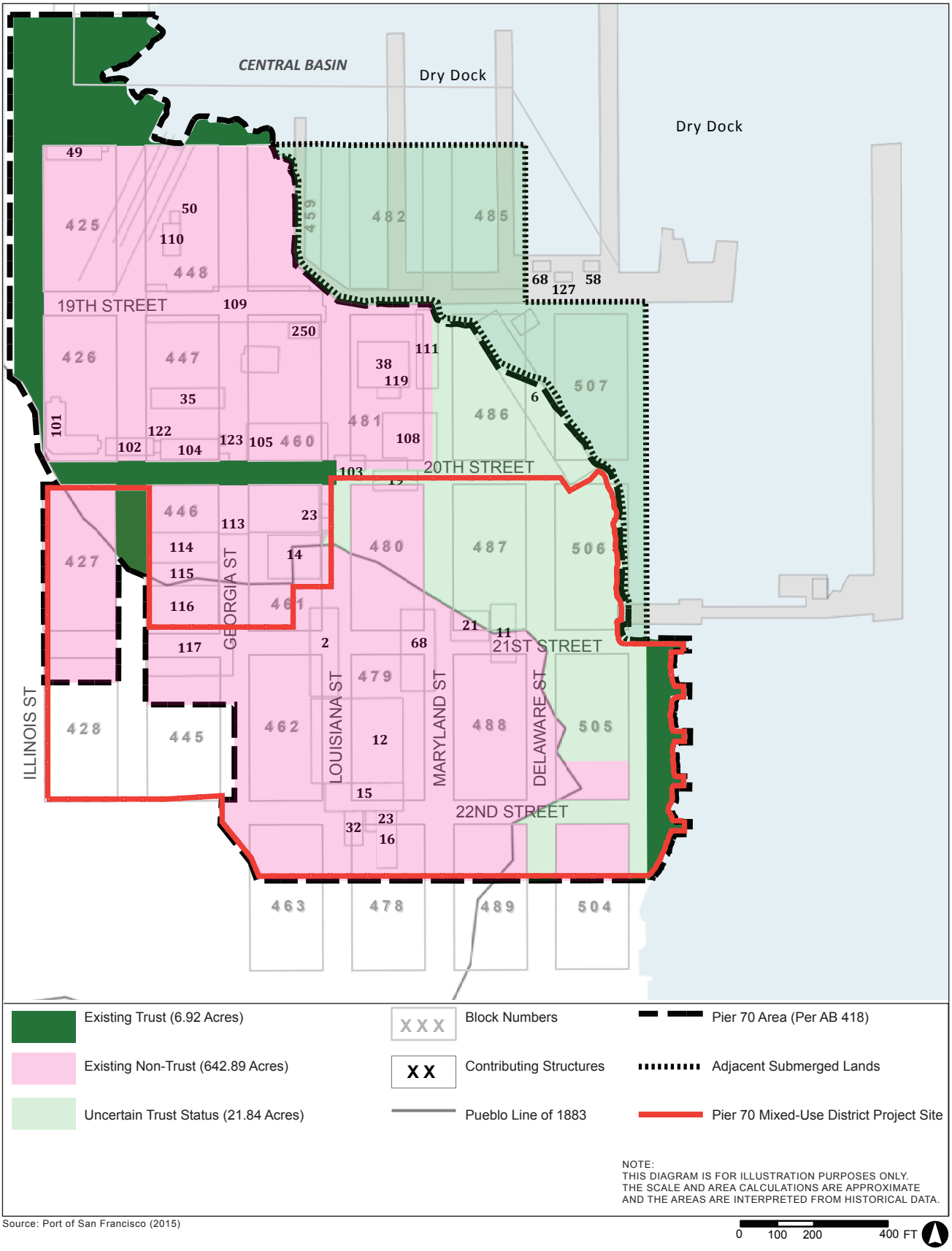
Central Waterfront Area Plan

The Proposed Project comprises the northeastern portion of the *Central Waterfront Area Plan*, as shown on Figure 2.1, p. 2.6. The *Central Waterfront Area Plan* is one of the four plan areas covered by the *Eastern Neighborhoods Rezoning and Area Plan (Eastern Neighborhoods Area Plan)*, which the Board of Supervisors adopted in 2009.[27] The Eastern Neighborhoods area contains much of the City's industrial zoned land and has been transitioning to other uses over the past several decades. One of the goals of the Eastern Neighborhoods planning effort was to find a balance between the growth of housing and office uses and the preservation of production, distribution, and repair (PDR) facilities.[28] The project site was included in one of the four sub-areas of the *Eastern Neighborhoods Area Plan* (as part of the *Central Waterfront Area Plan)*, but, except for height increases affecting the Illinois Parcels, the Pier 70 parcels were not rezoned, deferring to the Port-led community planning process for Pier 70, described previously on p. 2.7.

[26] California State Lands Commission, The Public Trust Doctrine. Available online at http://www.slc.ca.gov/About_The_CSLC/Public_Trust/Public_Trust_Policy.pdf. Accessed on October 19, 2016.

[27] San Francisco Planning Department website, *Eastern Neighborhoods*, available online at www.sf-planning.org/index.aspx?page=1673, accessed April 6, 2015. The other plan areas within the *Eastern Neighborhoods Area Plan* are Central Waterfront (adjacent and west of the Central Waterfront Area Plan), Mission (west of Potrero), Showplace Square/Potrero (adjacent and north of Potrero), and East SOMA (i.e., East South of Market, which is northwest of Mission Bay).

[28] San Francisco Planning Department website, *About the Eastern Neighborhoods*, available online at www.sf-planning.org/index.aspx?page=1677#1, accessed September 24, 2015.



Source: Port of San Francisco (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.3: EXISTING PUBLIC TRUST LANDS

Zoning and Height and Bulk Districts

The 28-Acre Site is zoned M-2 (Heavy Industrial) and located in a 40-X Height and Bulk District. The Illinois Parcels are zoned M-2 and P (Public) and located in a 40-X and a 65-X Height and Bulk District. Existing and proposed height and bulk limits are shown on Figure 2.4: Existing and Proposed Height and Bulk Districts. Planning Code amendments associated with the *Eastern Neighborhoods Area Plan* increased height limits, from 40 to 65 feet, for the Illinois Parcels and the western portion of the Hoedown Yard. Height limits for the eastern portion of the Hoedown Yard and the entirety of the 28-Acre Site were not changed and remain at 40 feet. As authorized by Proposition F in November 2014, height limits on the 28-Acre Site would be increased to 90 feet, except for a 100-foot-wide band adjacent to the shoreline that would remain at 40 feet.

PORT OF SAN FRANCISCO

Waterfront Land Use Plan

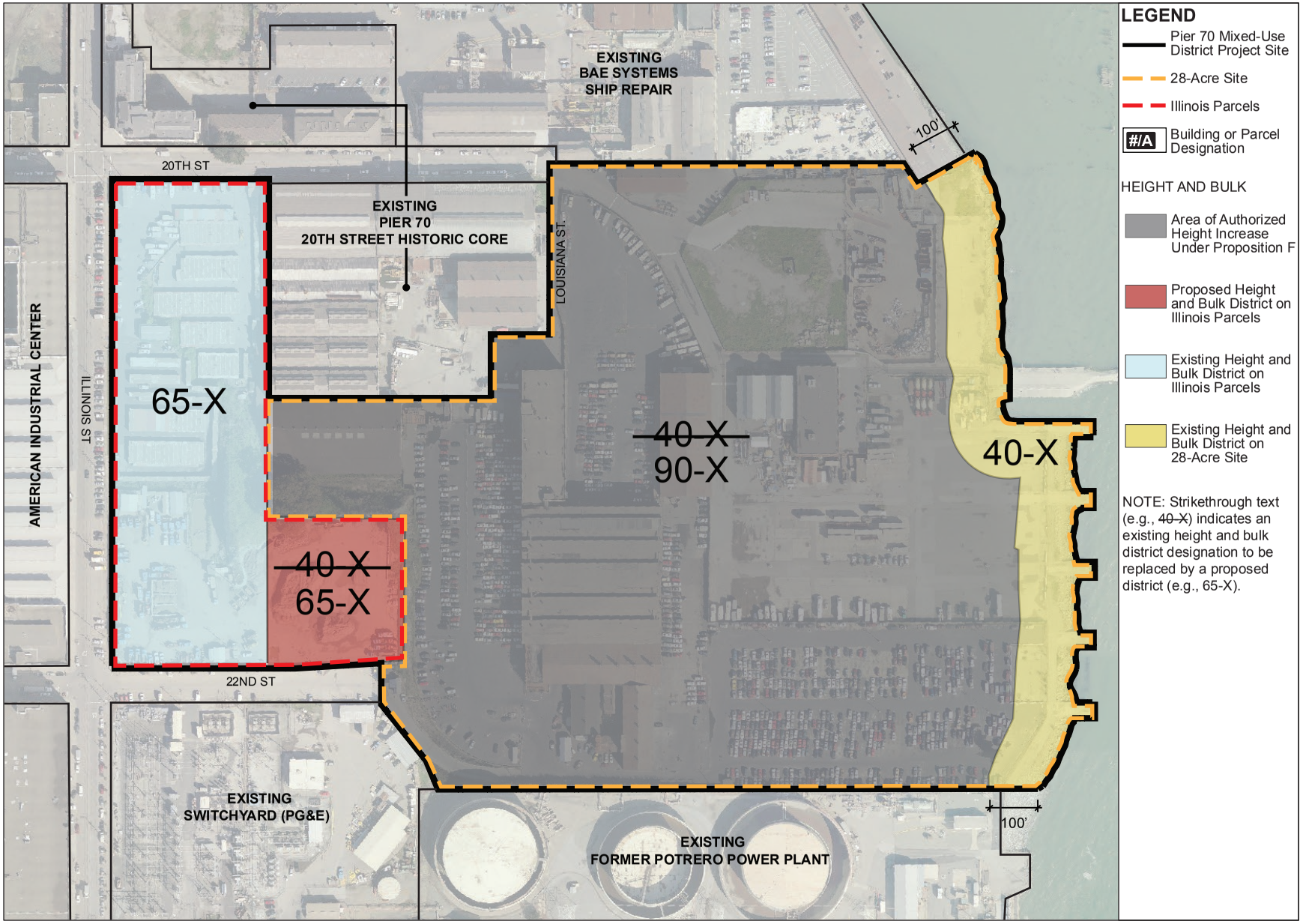
The majority of the Proposed Project is within the Port of San Francisco's WLUP, which is a land use policy document governing property under the jurisdiction of the Port, generally from Fisherman's Wharf to India Basin.[29] The Hoedown Yard is not under Port jurisdiction and is therefore not covered in the WLUP. The WLUP Southern Waterfront Subarea extends from Mariposa Street, just north of the project site, south to and including India Basin.[30]

Port of San Francisco Pier 70 Preferred Master Plan

As noted on p. 2.7, through a community-based planning process, the Port developed the *Preferred Master Plan*, dated April 2010. The *Preferred Master Plan* sets forth the Port's vision for Pier 70, which is to "create a vibrant and authentic historic district that re-establishes the historic activity level, activates new waterfront open spaces, creates a center for innovative industries, and integrates ongoing ship repair operations." The plan also provides a framework for Pier 70 that serves to allocate land between parks, ship repair, historic rehabilitation, and new development sites; establish infill design guidelines to protect the integrity of the Historic District as new development occurs; and prioritize investment in the most significant historic buildings.

[29] City and County of San Francisco, Port of San Francisco, *Waterfront Land Use Plan*, Revised Version, 2009. Available online at http://www.sfport.com/index.aspx?page=294. In 2014-2015, Port staff completed the comprehensive Waterfront Plan 1997-2014 Review Report and developed a public process for targeted updates to the Waterfront Plan. Draft updates to the *Waterfront Land Use Plan* are anticipated in the spring of 2017.

[30] City and County of San Francisco, Port of San Francisco, *Waterfront Land Use Plan*, Map of the Southern Waterfront Subarea, Revised Version, 2009, p. 163A.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.4: EXISTING AND PROPOSED HEIGHT AND BULK DISTRICTS

PROJECT SITE CHARACTERISTICS

The project site currently contains approximately 351,800 gsf of buildings and facilities, most of which are deteriorating. Current uses on the site, all of which are temporary, include special event venues, artists' studios, self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, and office spaces.

The project site has varying topography, sloping up from San Francisco Bay, with an approximately 30-foot increase in elevation at the western extent of the 28-Acre Site. The 35-foot-tall remnant of Irish Hill is located in the southwestern portion of the project site and straddles both the 28-Acre Site and Illinois Parcels. Impervious surface covers approximately 98 percent of the 28-Acre Site and approximately 43 percent of the Illinois Parcels.

28-ACRE SITE

The existing buildings on the 28-Acre Site are mostly low- to mid-rise structures in deteriorating condition. The site also includes a small portion of the remaining 1.4-acre remnant of Irish Hill. (See Figure 2.2, p. 2.11.) The Port has entered into interim leases and licenses for all of the useable buildings. Current uses of these buildings are as follows:

- Building 2, a warehouse space, is leased by Paul's Stores for storage.
- Building 11, known as the Noonan Building and previously used as administration and design offices for the World War II shipbuilding yard, is currently leased as artists' studios and office space.
- The Building 12 complex and the paved lot to the west of the complex are used for community, arts and cultural, and special events through a Port license to Forest City. The complex, made up of Building 12 (former Plate Shop No. 2), Building 15 (former Layout Yard), Building 16 (former Stress Relieving Building), Building 25 (former washroom and lockers), and Building 32 (former Template Warehouse), was once used for producing ship hull plates.
- Building 19 is part of the BAE Systems lease premises, where it is used to store sandblasting grit. Building 19 is identified in the BAE lease as an area the Port can remove from the lease with a 6-month notice starting in January 2017.
- Building 21, an electrical substation and a former Risdon Iron Locomotive Works and Pacific Rolling Mills Company building, is partially leased to the SOMArts Cultural Center for storage.

The Port has also leased certain portions of the land within the project site, including four former slipways (Slipways 5, 6, 7, and 8) on the 28-Acre Site, which have been filled and paved. Current uses are as follows:

- West of Building 11 (the Noonan Building), SOMArts and Ernest Rivera lease paved land for storage.

- Affordable Self Storage leases the southeastern corner of the slipways, which includes rows of self-storage lockers.
- Immediately north of Affordable Self Storage, Boas International leases an area for new automobile storage.

With the exception of a portion of the Affordable Self Storage lease area along the southern border of the project site and the studio/office uses in Building 11, all described leases and licenses are operating on a month-to-month basis as of July 31, 2016.

ILLINOIS PARCELS

20th/Illinois Parcel

The 20th/Illinois Parcel, which is owned by the Port and within the greater 69-acre Pier 70 boundary and the Historic District, is a paved area with asphalt lots used for paid parking, construction lay-down, and other temporary uses. The Port has leased this site to Imperial Parking, Inc. for commuter parking, terminable with 30 days' notice. Also, the 20th/Illinois Parcel contains a portion of the 1.4-acre remnant of Irish Hill, which straddles both the southeastern corner of the 20th/Illinois Parcel and the northeastern corner of the Hoedown Yard.

Hoedown Yard

South of the 20th/Illinois Parcel, the PG&E-owned Hoedown Yard is used by PG&E for vehicle parking, equipment storage (in the western portion of the yard), and temporary stockpiling of materials generated from subsurface utility maintenance operations in San Francisco (in the eastern portion of the yard). PG&E also uses a portion of the site as a settling area for drilling mud (a mixture of bentonite and water) that has been used by PG&E crews for off-site utility work.

A remaining section of Irish Hill is located in the northeastern corner of the Hoedown Yard. The Hoedown Yard is outside of the 69-acre Pier 70 boundary, but it is included in the project site and proposed SUD.

LANDSCAPE AND VEGETATION

The project site has varying topography, sloping down toward San Francisco Bay, with a prominent decrease in elevation at the eastern extent of the 28-Acre Site. The project site has almost no vegetation, with the exception of the remnant of Irish Hill in the Hoedown Yard, which contains scattered ground-level shrubs and a stand of eucalyptus trees, and scattered vegetation east of Building 19, near the radio antenna in the northeastern part of the site. There are no significant landscape elements or street trees.

INFRASTRUCTURE

Potable and Recycled Water Systems

The San Francisco Public Utilities Commission (SFPUC) provides potable water to the project site through a 12-inch-diameter domestic water line that runs underneath 20th Street and extends along the northern boundary of the project site. Other domestic water lines in the vicinity of the project site include an 8-inch-diameter water line underneath Illinois Street and an 8-inch line beneath 22nd Street. This system provides potable water to the project site for all site uses, as well as low-pressure water for firefighting purposes. The fire hydrants closest to the project site are located near the intersections of Illinois and 22nd streets (one hydrant), Illinois and 20th streets along the northern property boundary (four hydrants), and 19th and Illinois streets (one hydrant). Currently the City does not provide recycled (reclaimed) water on the eastern side of San Francisco or within the project site.

The Auxiliary Water Supply System (AWSS), also known as the San Francisco Emergency Firefighting Water System, provides a supplemental high-pressure water source for fire-fighting in certain areas of San Francisco. At this time, the AWSS does not extend into the project site, although there is a 14-inch distribution line location beneath Third Street.

Wastewater and Stormwater System

The project site is served by the City's combined sewer system that is operated by the SFPUC. The project site is located within the 20th Street sub-basin of the City's combined sewer system. This sub-basin includes 8-inch and 18-inch sewer conveyance pipes in 20th Street from Illinois Street to Louisiana Street that convey both stormwater and wastewater to 42-inch sewer line beneath 20th Street east of Louisiana Street, and a 54-inch storage and detention pipe along the eastern portion of the site that extends south from the pump station. These sewer lines are owned by the SFPUC and convey flows to the 20th Street pump station[31] near the northeast corner of the project site. In addition, the Port owns 6- to 12-inch mains across the site that connect to SFPUC-owned infrastructure. The pump station has a dry-weather capacity of approximately 2.65 million gallons per day (mgd).[32] Based on existing wastewater flows, the remaining capacity of the pump station is about 1.2 mgd. The existing 20th Street pump station is described in Section 4.K, Utilities and Service Systems.

[31] A pump station is a facility that includes pumps and equipment for pumping fluids from one place to another.

[32] San Francisco Public Utilities Commission (SFPUC), 20th Street Pump Station Volumetric Discharge Test and Contributing Flows, Technical Memorandum, August 30, 2013

Flows from the 20th Street pump station are conveyed to a 27-inch-diameter gravity sewer main under Illinois Street via a 10-inch-diameter force main located beneath 20th Street. From there, the combined stormwater and wastewater flows are conveyed to the Southeast Water Pollution Control Plant (SEWPCP) for treatment prior to discharge to San Francisco Bay in accordance with the National Pollutant Discharge Elimination System (NPDES) permit for the SEWPCP, North Point Wet Weather Facility, and all of the Bayside wet-weather facilities (Bayside NPDES Permit).

The 20th Street sub-basin includes 20th and 22nd streets combined sewer discharge (CSD) structures that are connected by the 54-inch storage and detention pipe. During wet weather, stormwater and wastewater flows that exceed the capacity of the 20th Street pump station plus the storage capacity of the 42- and 54-inch sewer lines are discharged through the CSD structures.

Electricity and Natural Gas

Electrical service to the project site is provided by PG&E and SFPUC Power via three 12-kilovolt (kV) electrical distribution circuits. One circuit is at 22nd Street, originating from the adjacent substation and transferring to a Port-owned underground distribution line near the edge of the property. The second runs overhead from the substation, traversing the remnant of Irish Hill, and continuing along Michigan Street to the corner of 20th Street before going underground to Port-owned distribution equipment in Building 102 near the edge of the 28-Acre Site. This currently serves as the primary circuit for the BAE Systems Ship Repair site. The third runs underground down 20th Street to the Port-owned distribution equipment in Building 102, and currently serves as the secondary circuit to the BAE site. An additional smaller overhead circuit also runs down 20th Street from Illinois Street and provides power to the combined sewer pump station. Two north-south overhead 12-kV electrical distribution lines traverse Illinois Street and connect to the PG&E Potrero Substation located on the eastern side of Illinois Street between 22nd and 23rd streets. There are 12 street lights around the asphalt lots on the southeastern end of the project site.

Natural gas is delivered to the project site through a PG&E-owned east-west natural gas line under 20th and Michigan streets. The Port owns natural gas lines that connect to the PG&E line on 20th Street. From there, several smaller Port-owned natural gas distribution lines circulate natural gas throughout the 28-Acre Site. Additionally, several abandoned Port-owned natural gas lines also exist within the project site. There are no existing natural gas lines connecting to the Illinois Parcels.

D. PROPOSED PROJECT CHARACTERISTICS

DEVELOPMENT CHARACTERISTICS

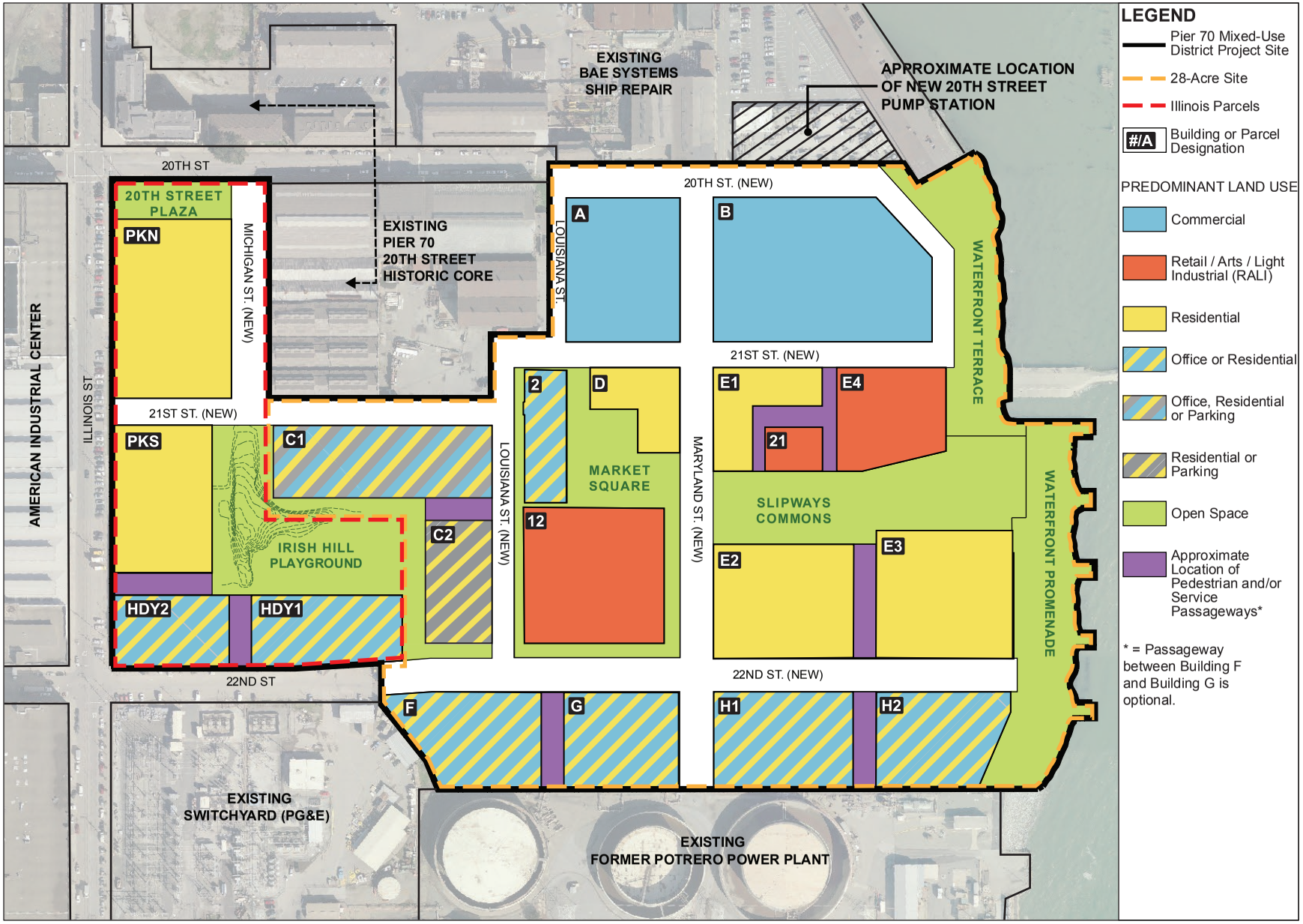
The Proposed Project would rezone the entire 35-acre project site and establish development controls for the site through adoption of a proposed SUD. (See Figure 2.5: Proposed SUD Land Use Program.) As envisioned, the Proposed Project would include market-rate and affordable residential uses, commercial use, RALI uses,[33] parking, shoreline improvements, infrastructure development and street improvements, and public open space. The proposed SUD would provide a mixed-use land use program in which certain parcels on the project site could be zoned as mixed-use, allowing for either commercial or residential uses. In addition, the proposed SUD would provide that two parcels on the project site (Parcels C1 and C2, located at the corner of Louisiana and the new 21st streets and near the western boundary of the 28-Acre Site) would be designated for structured parking, accessible to the public, but could be developed with either residential or commercial uses (Parcel C1) or residential uses (Parcel C2), depending on future market demand for parking and future methods of travel for residents and visitors.

Under the Proposed Project, development of the 28-Acre Site would include up to approximately 3,422,265 gsf of construction in new buildings and improvements to existing structures (excluding square footage allocated to accessory and structured parking). New buildings would range in height from 50 to 90 feet. Development of the Illinois Parcels would include up to approximately 801,400 gsf of construction in new buildings (excluding square footage allocated to accessory parking). New buildings on the Illinois Parcels would not exceed a height of 65 feet.

DEMOLITION AND REHABILITATION

The project site has 12 contributors to the Historic District and one non-contributor, totaling 351,800 gsf. The Proposed Project includes rehabilitation, in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, of approximately 227,800 gsf in Buildings 2, 12, and 21 for reuse. Buildings 2 and 12 would remain in their current location. Building 21 would be relocated about 75 feet to the southeast, to create public frontage along the waterfront park and maintain a visual connection to Buildings 2 and 12. (See Table 2.1: Existing and Rehabilitated Buildings on the Project Site, and Figure 2.6: Proposed Rehabilitation, Retention and Demolition Plan.) As part of the Proposed Project, seven of the remaining contributing buildings and structures on the site (Buildings 11, 15, 16, 19, 25, 32, and 66), containing 92,945 gsf, would be demolished. A small portion of the contributing feature, the

[33] The project sponsors describe the RALI use as including neighborhood-serving retail, arts activity, eating and drinking places, production distribution and repair, light manufacturing, and entertainment establishments.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.5: PROPOSED SUD LAND USE PROGRAM

remnant of Irish Hill, would also be removed. The Port has proposed to demolish the 30,940-gsf Building 117, located on the project site, separately from and prior to approval of the Proposed Project.[34] The non-contributing feature on the project site (subterranean portions of Slipways 5 through 8) would be partially removed as part of the Proposed Project.

Table 2.1: Existing and Rehabilitated Buildings on the Project Site

	Existing Gross Square Footage	Existing Gross Square Footage to Be Retained and Rehabilitated
Existing Buildings	351,800[1]	227,800[2]

Notes:

1 Includes Buildings 2, 11, 12, 15, 16, 19, 21, 25, 32, 66, and 117. The Port has proposed to demolish Building 117 separately from and prior to approval of the Proposed Project. The demolition of Building 117 will undergo appropriate environmental review, as required by CEQA.

2 The existing 227,800 gsf of retained building space are located in Buildings 2, 12, and 21 on the 28-Acre Site. These three buildings would be retained and rehabilitated as part of the Proposed Project.

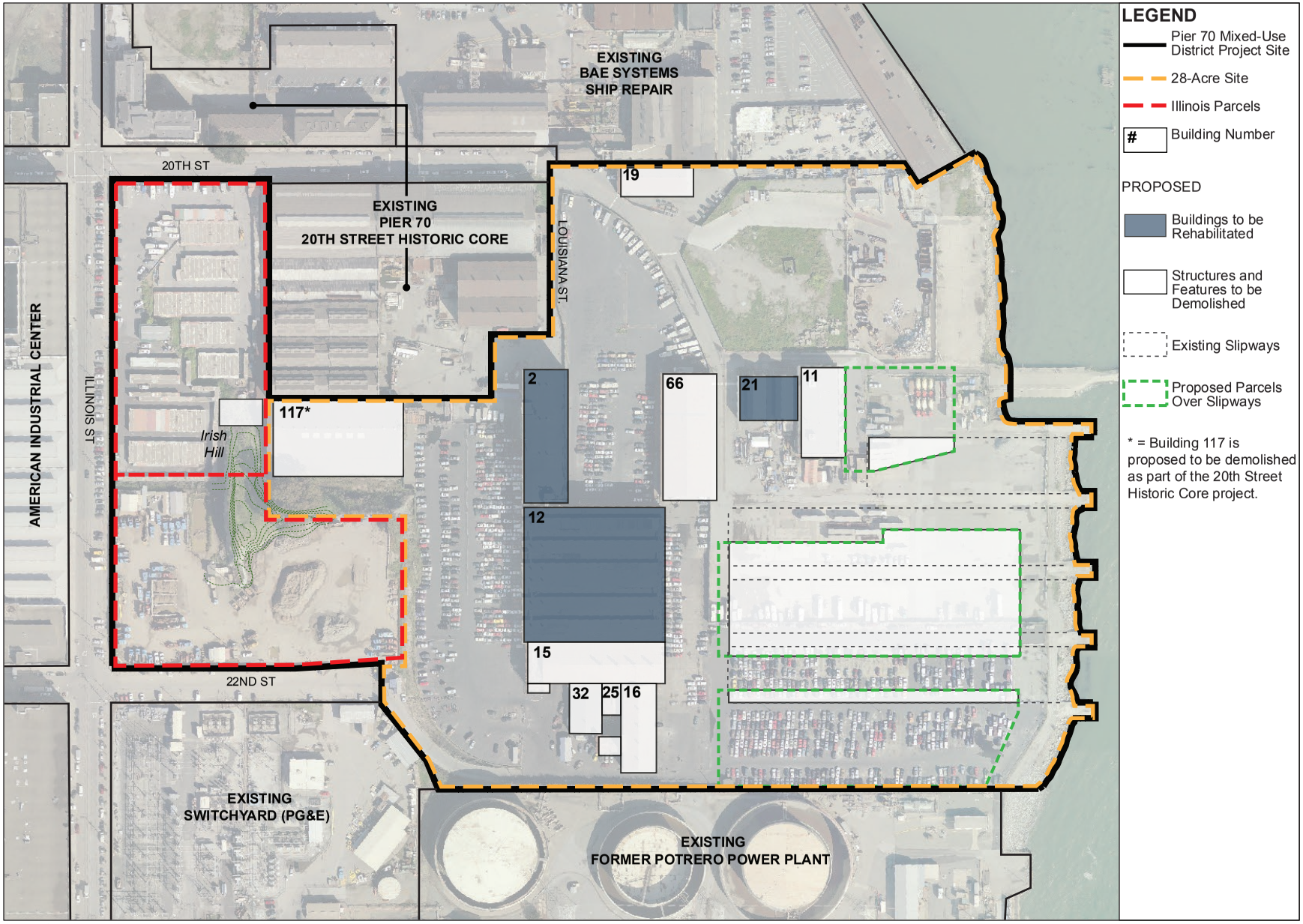
Sources: Forest City; Turnstone/SWCA

RELOCATION OF EXISTING TENANTS

The Port negotiated most of the existing leases on the 28-Acre Site and the 20th/Illinois Parcel after entering into exclusive negotiations with Forest City. All existing leases are short-term leases for interim uses, and all leases, except those for the tenants in Building 11 (the Noonan Building) and a portion of the Affordable Self Storage lease, are operating on a month-to-month basis and will be terminated in anticipation of the Proposed Project. The Port will develop a plan for tenant relocation to the extent required under the California Relocation Assistance Law (Cal. Gov. Code Sections 7260-7277) and applicable regulations. The Port will also try to relocate larger-scale tenants to other available, suitable Port property. As part of its proposed Fiscal Year 2015-2016 capital budget, the Port intends to improve 17 acres of the Pier 94 Backlands[35] as

[34] Building 117 is proposed for demolition as part of the 20th Street Historic Core project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code. The Port filed an application to demolish Building 117 on January 7, 2016, Case No. 2016-000346ENV. Any approval of the demolition of Building 117 will undergo appropriate environmental review, as required by CEQA. San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

[35] Pier 94 Backlands is a 23-acre unimproved Port-owned site located about one mile to the south of the project site. Future improvements associated with Pier 94 Backlands will undergo a separate review and entitlement process and are not included as part of the Proposed Project.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.6: PROPOSED REHABILITATION, RETENTION, AND DEMOLITION PLAN

paved, open industrial land. If constructed in time, the Backlands would be one of the potential relocation areas identified by Port staff for existing major tenants of industrial and storage uses currently at Pier 70.

In accordance with the Term Sheet between the Port and Forest City[36] and Proposition F (November 2014), the tenants of the Noonan Building would be provided on-site space that is affordable, functional, and aesthetic. Rent on the new space will be based on the Port's current parameter rent schedule for the Noonan Building inflated to the date the new space is available. Tenants of the Noonan Building would be continuously accommodated. If new space is not yet constructed on the project site prior to the demolition of the Noonan Building, the Port or Forest City would offer the tenants (most of whom are on month-to-month leases) replacement space elsewhere within the Pier 70 area.

SPECIAL USE DISTRICT AND LAND USE PROGRAM

The Proposed Project would amend the Planning Code to include the proposed Pier 70 SUD, and would amend the Zoning Maps to reflect the proposed SUD. The proposed SUD would require compliance with the proposed *Pier 70 SUD Design for Development*, which is discussed on p. 2.35. Under the proposed SUD, the Proposed Project would provide a mixed-use land use program in which certain parcels (Parcels F, G, H1, H2, HDY1, and HDY2) and Building 2 could be developed for either primarily commercial uses or residential uses. Parcels C1 and C2 would be designated for structured parking, but could be developed with either residential or commercial (Parcel C1) or residential uses (Parcel C2), depending on future methods of travel for residents and visitors.

Proposed new zoning in the SUD would permit the following uses, listed below by parcel and shown in Table 2.2: Proposed Pier 70 Special Use District – Primary Uses by Parcel and Rehabilitated Building.

On the 28-Acre Site:

- Parcels A and B: Restricted to primarily commercial use, with RALI uses allowed on the ground floor.
- Parcel C1: Permitted for commercial, residential, or structured parking uses with RALI uses allowed on the ground floor.
- Parcel C2: Permitted for either residential or structured parking uses, with RALI uses allowed on the ground floor.
- Parcels D, E1, E2, and E3: Restricted to primarily residential use, with RALI uses allowed on the ground floor.

[36] *Term Sheet for Pier 70 Waterfront Site*, between the Port Commission and Forest City, June 11, 2013.

Table 2.2: Proposed Pier 70 Special Use District – Primary Uses by Parcel and Rehabilitated Building

Parcel or Rehabilitated Building	Allowable Use									Maximum Height (Feet)
	Residential		Commercial			Structured Parking		RALI (Ground Floor)		
28-Acre Site[1]										
A			●					●		90
B			●					●		90
C1	●	**or**	●	**or**		●		●		90
C2	●	**or**				●		●		90
D	●							●		90
E1	●							●		90/65
E2	●							●		70
E3	●							●		70
E4			● Upper Floor					●		50
F	●	**or**	●					●		90
G	●	**or**	●					●		90
H1	●	**or**	●					●		90
H2	●	**or**	●					●		90
Building 2	●	**or**	●					●		Existing (82)
Building 12			● Upper Floor					●		Existing (60)
Building 21								●		Existing (44)
Illinois Parcels[2]										
PKN	●							●		65
PKS	●							●		65
HDY1	●	**or**	●					●		65
HDY2	●	**or**	●					●		65

Notes:

[1] In addition to the uses listed, all 28-Acre Site parcels are permitted to include accessory parking. However, this does not apply to existing Buildings 2, 12, and 21, and Parcel E4.

[2] In addition to the uses listed, all Illinois Parcels are permitted to include accessory parking.

Sources: Forest City; Turnstone/SWCA

- Parcels F, G, H1, and H2, and Building 2: Permitted for either commercial or residential uses, with RALI uses allowed on the ground floor.
- Parcel E4 and Buildings 12 and 21: Permitted for RALI uses with commercial allowed on the upper floor of Parcel E4 and Building 12.
- All 28-Acre Site parcels except existing Buildings 2, 12, and 21 and Parcel E4: Permitted to include accessory parking.

On the Illinois Parcels:

- 20th/Illinois Parcel (Subdivided into Parcel K North [PKN] and Parcel K South [PKS]): Restricted to primarily residential use, with RALI uses on the ground floor.
- Hoedown Yard (Subdivided into Parcel Hoedown Yard 1 [HDY1] and Parcel Hoedown Yard 2 [HDY2]): Permitted for either commercial or residential uses, with RALI uses allowed on the ground floor.
- All Illinois Parcels: Permitted to include accessory parking.

Development under the proposed SUD is intended to provide a balanced mix of uses to support revitalization of the project site and respond to market conditions in the project site vicinity. To cover a full range of potential land uses that could be developed under the proposed SUD, this EIR analyzes a maximum residential-use scenario and a maximum commercial-use scenario for the project site. The two scenarios bracket specific maximum ranges of uses that could be developed under the proposed SUD.

The Maximum Residential Scenario and the Maximum Commercial Scenario for both the 28-Acre Site and the Illinois Parcels are mutually exclusive: the maximum commercial and maximum residential programs could not both be built. If the Proposed Project were to be built with the maximum amount of commercial space, less space would be developed with residential uses; conversely, if the maximum number of residential units were constructed, less space would be developed with commercial uses, as described below. Depending on the uses developed, the Proposed Project's total gsf would range between a maximum of 4,212,230 gsf, under the Maximum Residential Scenario, to 4,179,300 gsf, under the Maximum Commercial Scenario, excluding square footage associated with accessory and structured parking.[37] Total construction would not exceed a maximum of 3,422,265 gsf on the 28-Acre Site and 801,400 gsf on the Illinois Parcels.

For both development scenarios, construction is projected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve up to five phases.

[37] Per the Planning Code, parking and mechanical equipment space do not count toward gross square footage.

Maximum Residential Scenario

28-Acre Site

Development under the Maximum Residential Scenario on the 28-Acre Site would include a maximum of up to 3,410,830 gsf in new and renovated buildings (excluding square footage allocated to parking). (See Table 2.3: Project Summary Table – Maximum Residential Scenario, and Figure 2.7: Proposed Land Use Plan – Maximum Residential Scenario.) Under this scenario, there would be up to 2,150 residential units (up to approximately 710 studio/one-bedroom units and 1,440 two- or more bedroom units), totaling about 1,870,000 gsf, as well as approximately 1,095,650 gsf of commercial space and 445,180 gsf of RALI space (241,655 gsf of retail space, 60,415 gsf of restaurant space, and 143,110 gsf of arts/light-industrial space). The overall development envelope includes rehabilitation of 237,800 gsf in Buildings 2, 12, and 21 in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Table 2.3 assumes that the parcels (Parcels F, G, H1, and H2) and Building 2 would be devoted to residential use, and Parcels C1 and C2 would be built as residential use in order to study the maximum gsf of development area on the project site under the Maximum Residential Scenario.

Illinois Parcels

Development under the Maximum Residential Scenario on the Illinois Parcels would include a maximum of up to 801,400 gsf in newly constructed buildings (see Table 2.3). Under this scenario, there would be up to 875 residential units (up to approximately 290 studio/one-bedroom units and 585 two- or more bedroom units[38]) totaling about 760,000 gsf, as well as approximately 6,600 gsf of commercial area and approximately 34,800 gsf of RALI space (27,840 gsf of retail space and 6,960 gsf of restaurant space) in new buildings.

Maximum Commercial Scenario

28-Acre Site

Development on the 28-Acre Site under the Maximum Commercial Scenario would include a maximum of up to about 3,422,265 gsf in new and renovated buildings. (See Table 2.4: Project Summary Table – Maximum Commercial Scenario, and Figure 2.8: Proposed Land Use Plan – Maximum Commercial Scenario.) Under this scenario, there would be up to 1,100 residential units (up to approximately 365 studio/one-bedroom units and 735 two- or more bedroom units)

[38] The exact mix of dwelling unit types to be provided by the Project has not been established at this time; For purpose of analysis in this EIR, it has been assumed that 33 percent of the total number of dwelling units under each scenario would be analyzed as studios or one-bedroom units, while 67 percent would be analyzed as having two or more bedrooms.

Table 2.3: Project Summary – Maximum Residential Scenario

Use	28-Acre Site (New and Rehabilitated Construction)	Illinois Parcels (New Construction)	Maximum Proposed Project Totals
Residential	1,870,000 gsf	760,000	**2,630,000 gsf**
No. of units	2,150 units	875 units	**3,025 units**
Parcels	*C1, C2, D, EI, E2, E3, F, G, H1, H2, Building 2*	*PKN, PKS, HDY1, HDY2*	
Commercial	1,095,650 gsf[1]	6,600 gsf	**1,102,250 gsf**
Parcels	*A, B*	*PKN*	
RALI	445,180 gsf	34,800 gsf	**479,980 gsf**
Retail	241,655 gsf	27,840 gsf	269,495 gsf
Restaurant	60,415 gsf	6,960 gsf	67,375 gsf
Arts/Light-Industrial	143,110 gsf		143,110 gsf
Parcels	*A, B, C1, C2, D, E1, E2, E3, E4, F, G, H1, H2; Buildings 2, 12, 21*[2]	*PKN, PKS, HDY1, HDY2*[3]	
Total	**3,410,830 gsf**	**801,400 gsf**	**4,212,230 gsf**
Parking[4, 5]			
Off-Street	2,708 spaces	662 spaces	3,370 spaces
On-Street	253 spaces	32 spaces	285 spaces
Open Space	6.5 acres	2.5 acres	9 acres

Notes:

1 The existing 227,800 gsf of retained, rehabilitated building space in Buildings 2, 12, and 21 on the 28-Acre Site would be renovated and converted into commercial, RALI, or residential, depending on location. The Proposed Project's total gsf reflects this retained and renovated space.

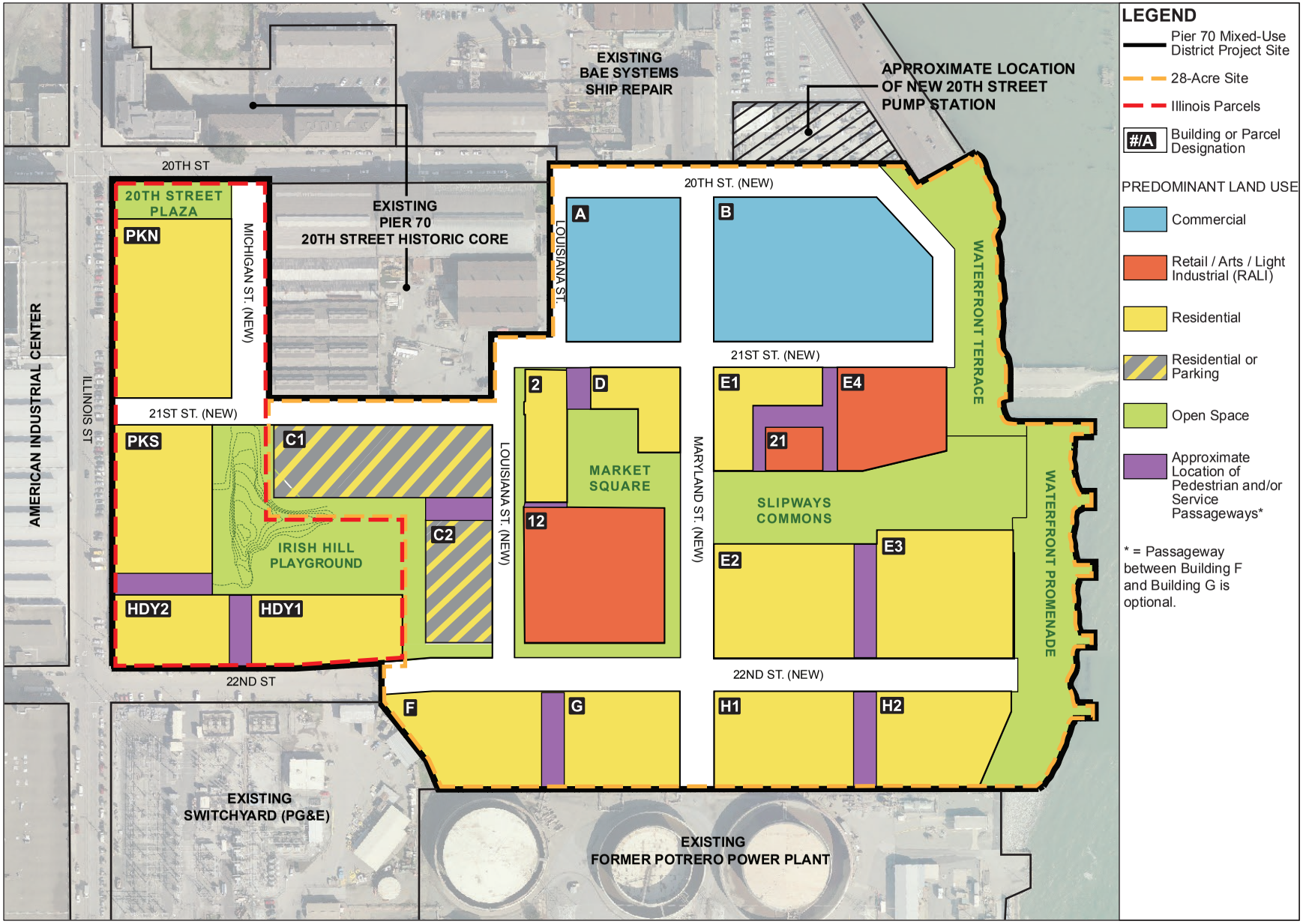
2 On the 28-Acre Site parcels, RALI would be located on the ground floor of the new or rehabilitated buildings. Building 21 would contain only RALI uses.

3 On Illinois Parcels PKN, PKS, HDY1, and HDY2, RALI would be located on the ground floor of the new buildings.

4 Parking totals reflect a maximum of one parking space per 1,000 gsf of commercial development and 0.75 parking spaces per residential unit.

5 All Illinois Parcels and 28-Acre Site parcels are permitted to include parking as an accessory use. Parcels C1 and C2 may have structured parking.

Sources: Forest City; Turnstone/SWCA



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

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FIGURE 2.7: PROPOSED LAND USE PLAN - MAXIMUM RESIDENTIAL SCENARIO

Table 2.4: Project Summary – Maximum Commercial Scenario

Use	28-Acre Site (New and Rehabilitated Construction)	Illinois Parcels (New Construction)	Maximum Proposed Project Totals
Residential	957,000 gsf	473,000 gsf	**1,430,000 gsf**
No. of units	1,100 units	545 units	**1,645 units**
Parcels	*C2, D, EI, E2, E3*	*PKN and PKS*	
Commercial	2,024,050 gsf[1]	238,300 gsf	**2,262,350 gsf**
Parcels	*A, B, C1, F, G, H1, H2, Building 2*	*PKN, HDY1, HDY2*	
RALI	441,215 gsf	45,735 gsf	**486,950 gsf**
Retail	238,485 gsf	36,590 gsf	275,075 gsf
Restaurant	59,620 gsf	9,145 gsf	68,765 gsf
Arts/Light-Industrial	143,110 gsf		143,110 gsf
Parcels	*A, B, C1, C2, D, E1, E2, E3, E4, F, G, H1, H2 and Buildings 2, 12, 21*[2]	*PKN, PKS, HDY1, HDY2*[3]	
Total	**3,422,265 gsf**	**757,035 gsf**	**4,179,300 gsf**
Parking[4, 5]			
Off-Street	2,849 spaces	647 spaces	3,496 spaces
On-Street	253 spaces	32 spaces	285 spaces
Open Space	6.5 acres	2.5 acres	9 acres

Notes:

1 The existing 227,800 gsf of retained, rehabilitated building space in Buildings 2, 12, and 21 on the 28-Acre Site would be renovated and converted into commercial, RALI, or residential, depending on location. The Proposed Project's total gsf reflects this retained and renovated space.

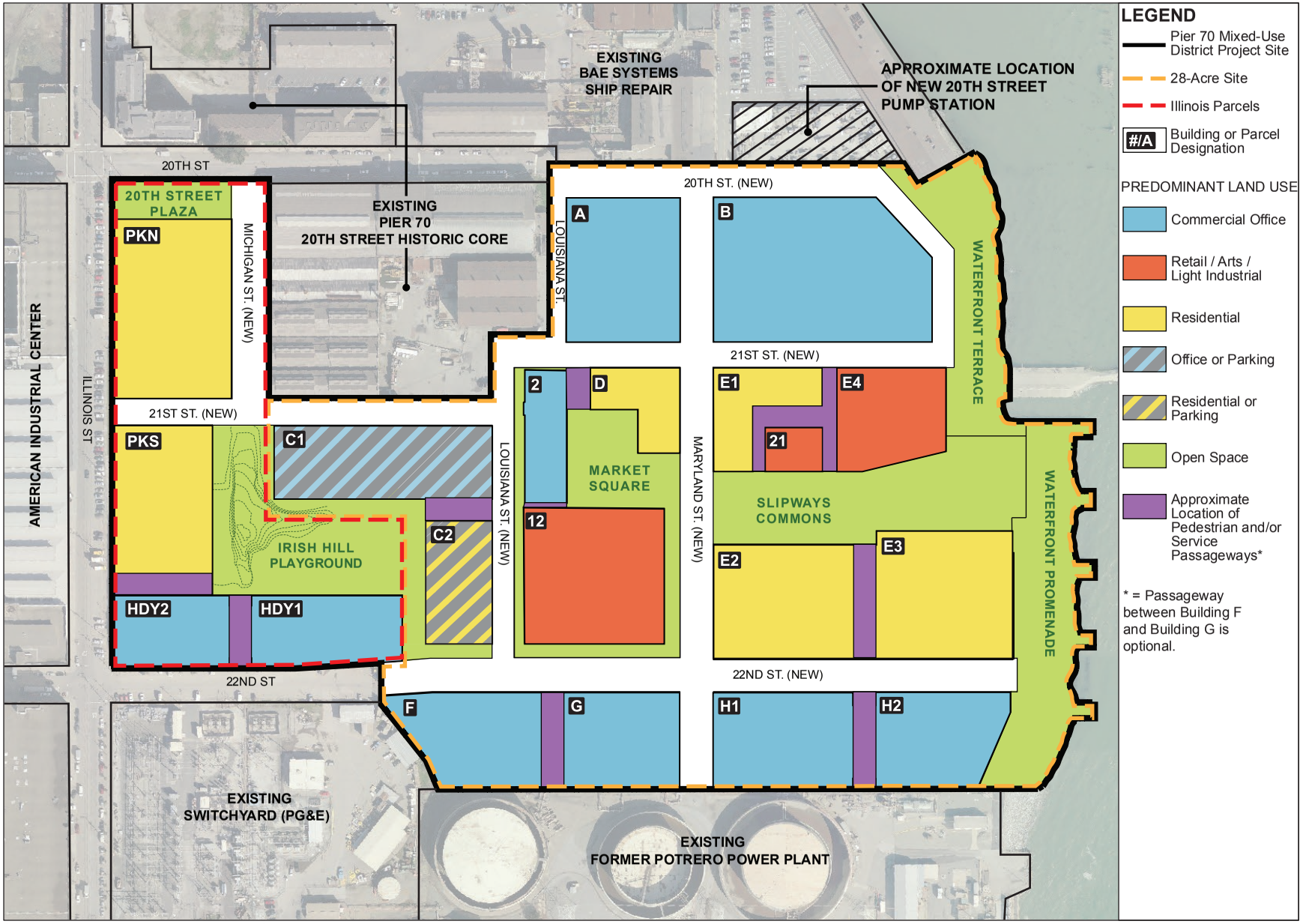
2 On the 28-Acre Site parcels, RALI would be located on the ground floor of the new or rehabilitated buildings. Building 21 would contain only RALI uses.

3 On Illinois Parcels PKN, PKS, HDY1, HDY2, RALI would be located on the ground floor of the new buildings.

4 Parking totals reflect a maximum of one parking space per 1,000 gsf of commercial development and 0.75 parking spaces per residential unit.

5 All Illinois Parcels and 28-Acre Site parcels are permitted to include parking as an accessory use. Parcels C1 and C2 may have structured parking.

Source: Forest City; Turnstone/SWCA



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.8: PROPOSED LAND USE PLAN - MAXIMUM COMMERCIAL SCENARIO

totaling about 957,000 gsf, as well as approximately 2,024,050 gsf of commercial area, and 441,215 gsf of RALI space (238,485 gsf of retail space, 59,620 gsf of restaurant space, and 143,110 gsf of arts/light-industrial space). The overall development envelope includes the rehabilitation of 227,800 gsf in Buildings 2, 12, and 21 in compliance with the Secretary of the Interior's Standards for Treatment of Historic Properties. As noted above, the mixed-use land use program contemplates two parcels, Parcels C1 and C2, that may be developed for parking, residential, or commercial use depending on future market demand for parking and future travel patterns. The project summary shown in Table 2.4 assumes that certain parcels (Parcels C1, F, G, H1, H2, and Building 2) would be developed as commercial use and that Parcel C2 would be developed as residential use in order to study the maximum gsf of development area on the project site under this Maximum Commercial Scenario.

Illinois Parcels

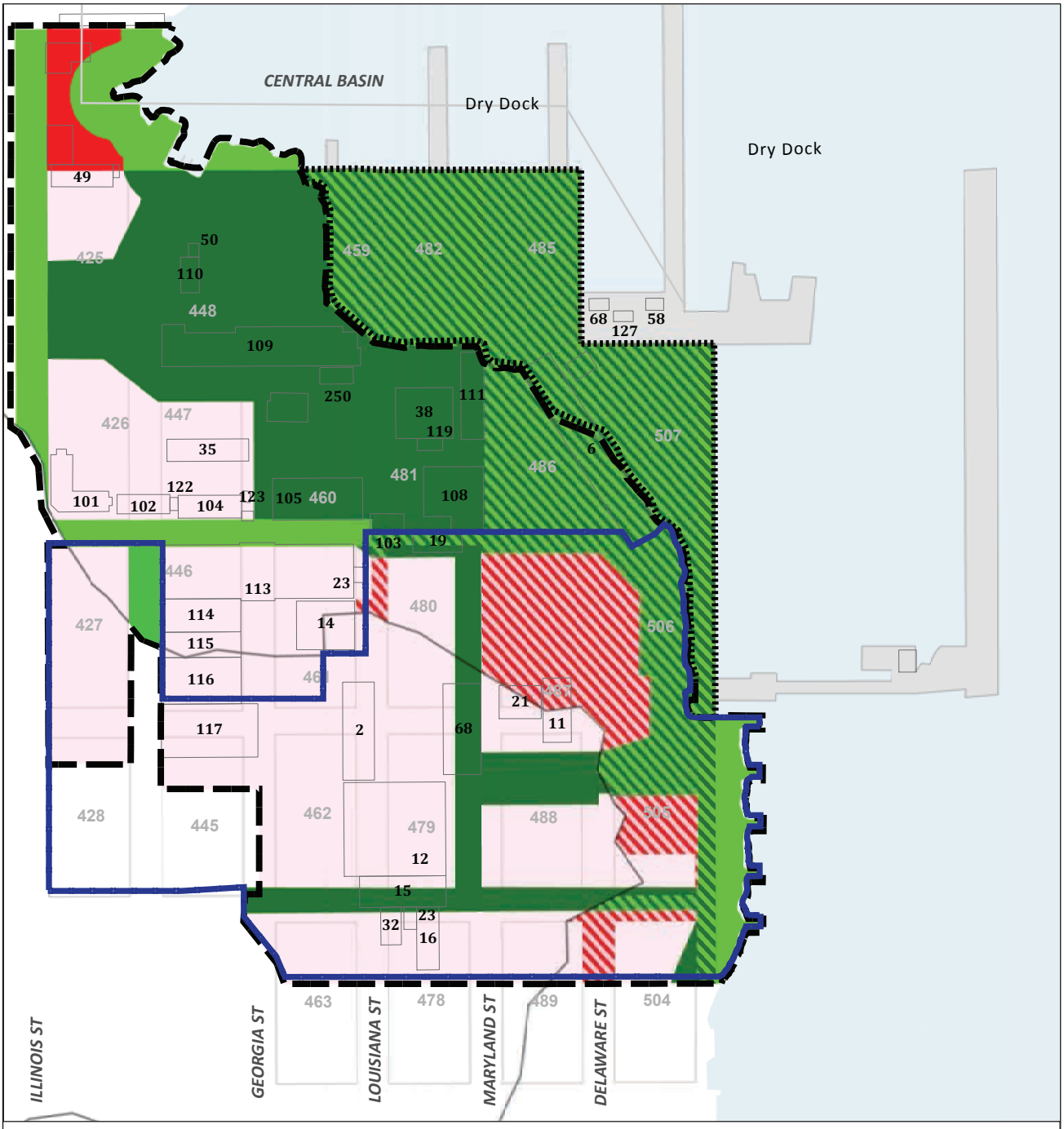
Development on the Illinois Parcels under the Maximum Commercial Scenario would include a maximum of about 757,035 gsf in new buildings (see Table 2.4). Under this scenario, there would be up to 545 residential units (up to approximately 180 studio/one-bedroom units and 365 two-or-more bedroom units[39]) totaling about 473,000 gsf, as well as approximately 238,300 gsf of commercial area and approximately 45,735 gsf of RALI (36,590 gsf of retail space and 9,145 gsf of restaurant space) in new buildings.

PUBLIC TRUST EXCHANGE

As described on p. 2.13, portions of the 28-Acre Site and Illinois Parcels are subject to the common law public trust for commerce, navigation, and fisheries and the statutory trust under the Burton Act, as amended (the Public Trust). (See Figure 2.3, p. 2.14.) In order to clarify the Public Trust status of portions of Pier 70, the Port has obtained State legislation (AB 418) that authorizes the State Lands Commission to approve a Public Trust exchange that would free some portions of the project site from the Public Trust while committing others to the Public Trust.[40] (See Figure 2.9: Proposed Public Trust Exchange Configuration.) To implement the Proposed Project in accordance with the proposed SUD, the Port and State Lands Commission would have to implement a public trust exchange that would lift the Public Trust from designated portions of Pier 70 in accordance with the terms of a negotiated trust exchange agreement meeting the requirements of AB 418. The Hoedown Yard is not subject to the Public Trust and will not be affected by the trust exchange.

[39] Ibid.

[40] Assembly Bill 418 (stats. 2011, ch. 447).



Source: Port of San Francisco (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.9: PROPOSED PUBLIC TRUST EXCHANGE CONFIGURATION

AFFORDABLE HOUSING PROGRAM

Under the Proposed Project, 30 percent of all completed residential units on the 28-Acre Site would be required to be offered at below market rate prices, and a majority of residential units constructed would be rentals, in compliance with Proposition F. The Proposed Project's affordable housing requirement would be established through transaction documents between the City, the Port, and Forest City for the Proposed Project. Residential units on the Illinois Parcels would be subject to the affordable housing requirements in Section 415 of the Planning Code. Under Board of Supervisors Resolution No. 54-14, if the City exercises its option to purchase the Hoedown Yard from PG&E, proceeds from the sale of the Hoedown Yard would be directed to the City's HOPE SF housing program, which includes the Potrero Terrace and Annex HOPE SF project.

PROPOSED PIER 70 SUD DESIGN FOR DEVELOPMENT BUILDING DESIGN STANDARDS AND GUIDELINES

The Proposed Project would amend the *General Plan* and Planning Code, adding a new Pier 70 SUD, which would establish land use zoning controls for the project site, and incorporate the design standards and guidelines in the proposed *Design for Development*. The *Design for Development* includes proposed building design standards and guidelines (Building Design Standards) which are intended to address compatibility of new development within the project site with the Historic District, guide rehabilitation of existing historic buildings as critical anchors, and encourage architecture of its own time in new construction.

Future vertical development at the project site, whether constructed by Forest City, Forest City affiliates, or third-party developers selected by the Port through broker-managed offerings, would be bound by the *Design for Development,* including the Building Design Standards. The Port and Planning Department would use the proposed Building Design Standards to evaluate these future development proposals within the project site for conformity with the *Pier 70 SUD Design for Development.* The Port will review historic rehabilitation proposals through its building permit process, for compatibility with the Secretary's Standards in the context of the Historic District.

Components of the proposed Building Design Standards are described below. Conceptual renderings showing visualizations of representative design viewpoints are shown in Figure 2.10: Representative Waterfront Promenade and Building 12 Market Square Views, Figure 2.11: Representative Slipways Commons Views, and Figure 2.12: Representative 20th Street and 22nd Street Views.



Representative Waterfront Promenade View Looking North



Representative Building 12 Market Square View Looking Southwest

Source: Sitelab Urban Studio (2016)

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FIGURE 2.10: REPRESENTATIVE WATERFRONT PROMENADE AND BUILDING 12 MARKET SQUARE VIEWS



Slipways Commons: Representative View Looking East



Slipways Commons: Representative Vew Looking West

Source: Sitelab Urban Studio (2016)

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FIGURE 2.11: REPRESENTATIVE SLIPWAYS COMMONS VIEWS



Representative View of 20th Street Looking East



Representative View of 22nd Street Looking East

Source: Sitelab Urban Studio (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.12: REPRESENTATIVE 20TH STREET AND 22ND STREET VIEWS

BUILDABLE ZONES AND MAXIMUM BUILDING ENVELOPES

New construction within the Illinois Parcels (Parcels HDY1, HDY2, PKN and PKS) would have a maximum height of 65 feet. On the 28-Acre Site, buildings up to 90 feet in height could generally be constructed along its southern, western, and northern perimeters (Parcels A, B, C1, C2, D, and portions of Parcels E1, F, G, H1, and H2). (See Figure 2.13: Proposed Height Limits Plan.)

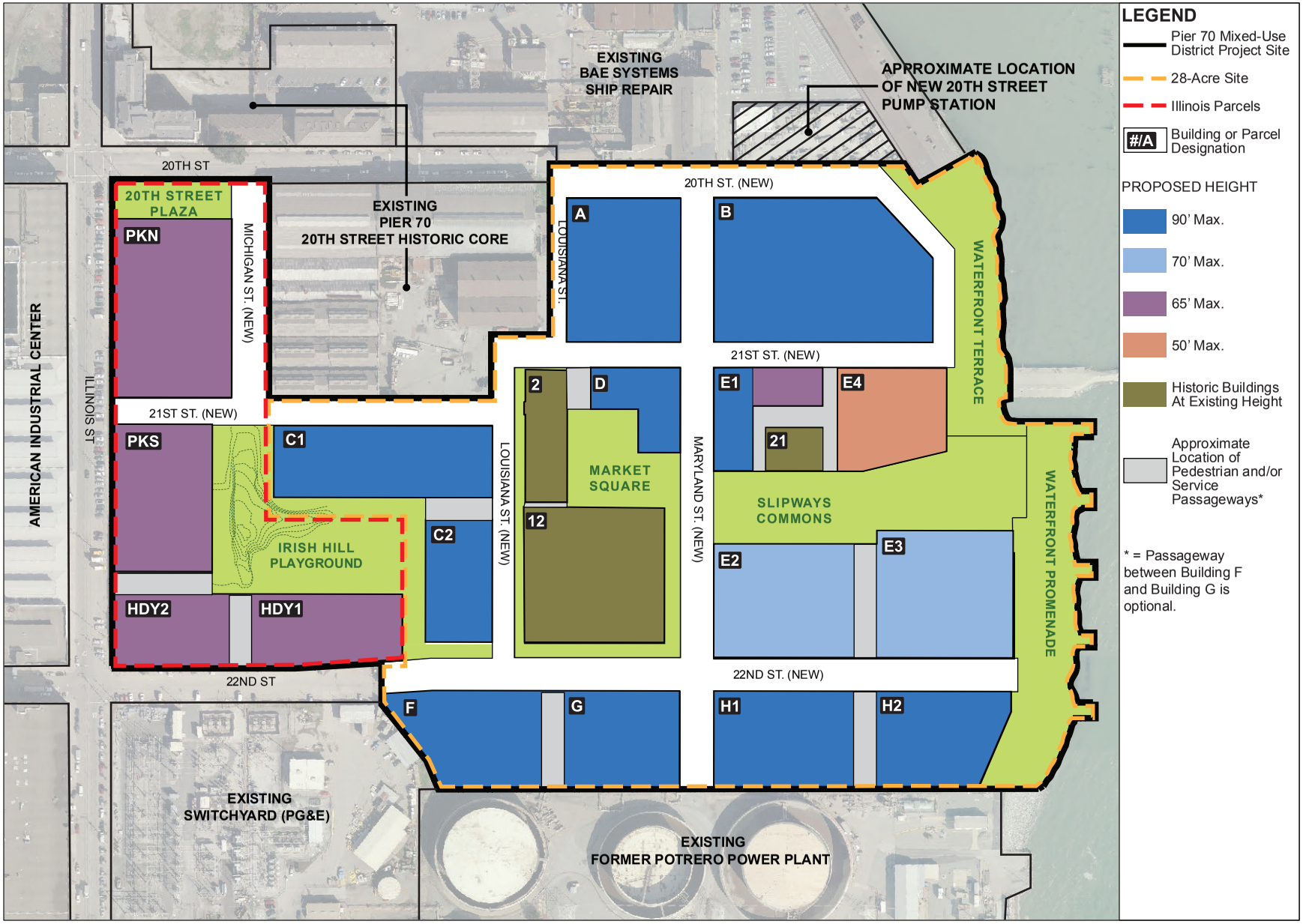
The Building Design Standards define new construction zones within the project site, separated from retained historic structures by buffer zones formed by the proposed network of streets and open spaces. Within the new construction zones, the Building Design Standards would establish building envelopes for new construction within each parcel intended to maintain varied heights in new construction and create juxtapositions of scale to relate to the historic character of the site. As part of the Proposed Project, existing Buildings 2 and 12, in the central portion of the site, would be retained at their existing heights of approximately 82 feet and 60 feet, respectively. At the center and eastern portions of the site (portion of Parcel E1, and Parcels E2, E3, and E4), new buildings would be limited to heights between 50 to 70 feet. Existing Building 21, which is 44 feet tall, would be moved about 75 feet southeast from its current location to a new site on the northern edge of the proposed Slipways Commons open space. In its new location, Building 21 would front the Slipways Commons open space and maintain a visual connection to Buildings 2 and 12. It would be framed by new 90-, 65-, and 50-foot-tall buildings to the west, north, and east, respectively.

REHABILITATION OF CONTRIBUTING STRUCTURES

The Building Design Standards call for rehabilitation of Buildings 2, 12, and 21 in accordance with the Secretary of the Interior's Standards for Rehabilitation. Except for grading activities necessary for the construction of 21st Street, the Building Design Standards specify that no substantial intervention shall be permitted on the remnant of Irish Hill that would be retained under the Proposed Project.

PROJECT-WIDE MASSING AND ARCHITECTURE

Project-wide standards and guidelines apply to all new construction, and are intended to encourage building variety and a pedestrian scale that meets the needs of a mixed-use neighborhood. The Building Design Standards include standards and guidelines that promote a strong building streetwall in all new construction to support a cohesive urban fabric, relate to the pattern of historic buildings, define views through the site and to the water, and create an active urban street for pedestrians. Standards and guidelines also call for the following:



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.13: PROPOSED HEIGHT LIMITS PLAN

- Defining a differentiated building base zone;
- Reinforcing a transparent and active ground floor to engage pedestrians;
- Promoting high-quality storefront and building entry design;
- Prohibiting long expanses of blank wall;
- Prohibiting the replication of historic buildings in new construction;
- Promoting architectural variety requiring that all new buildings be visually distinct from each other, with variations in building massing, materials, and fenestration;
- Promoting depth and texture in façades with a variety of materials and treatments;
- Providing for non-occupiable horizontal projections such as marquees, awnings, and canopies, cornices, and louvers; and
- Providing for occupiable projections such as bay windows and balconies.

Other standards and guidelines address roof treatments, residential open space, garage and service entry design, and sustainability strategies for maximizing efficiency through thoughtful building design.

LOCATION-SPECIFIC MASSING AND ARCHITECTURE

Location-specific requirements call for increased attention to the design of the building envelope at particular key locations to respond to specific design issues at those locations.

Adjacency to Contributors of Historic District

To enhance compatibility of new construction with adjacent contributors to the Historic District, new buildings would reference adjacent contributing features through a range of strategies established to relate to the inherent qualities of the Historic District and to respect its character-defining features and unique views.

Setback and Massing Standards of Parcel A for Views of Historic Building 113

To maintain a visual gateway into the Historic District, and to maintain relationship with the adjacent 60-foot height of Building 113, the massing at the northwestern corner of Parcel A would be set back above 60 feet (the remainder of new construction on Parcel A would be 90 feet in height).

Height Referencing Dimensional Quality

To enhance compatibility of new construction with adjacent contributors to the Historic District, select façades of new construction across the street from or adjacent to contributing features would distinctly reference the height of the adjacent building, within a 5-foot height range in

order to align with the finished floors of new buildings. Dimensional quality means that certain key façades of new buildings would respond to the height of adjacent historic buildings by projecting or recessing from the vertical plane through the use of distinct fenestration lines, massing, setback, volumetric shifts, or changes in the façade material or color.

Related Treatment to Adjacent Contributors of Historic District

To enhance the compatibility of new construction with adjacent contributors to the Historic District, select façades of new construction would incorporate elements that relate to the adjacent historic building, in keeping with contemporary design and construction methods. Façades would include one or more of the following elements: (1) height, (2) bay rhythm/vertical modulation, (3) glazing proportions and/or pattern, (4) horizontal banding, (5) material grain, and (6) alignments with key edges or openings.

Limited and Prohibited Façade Materials

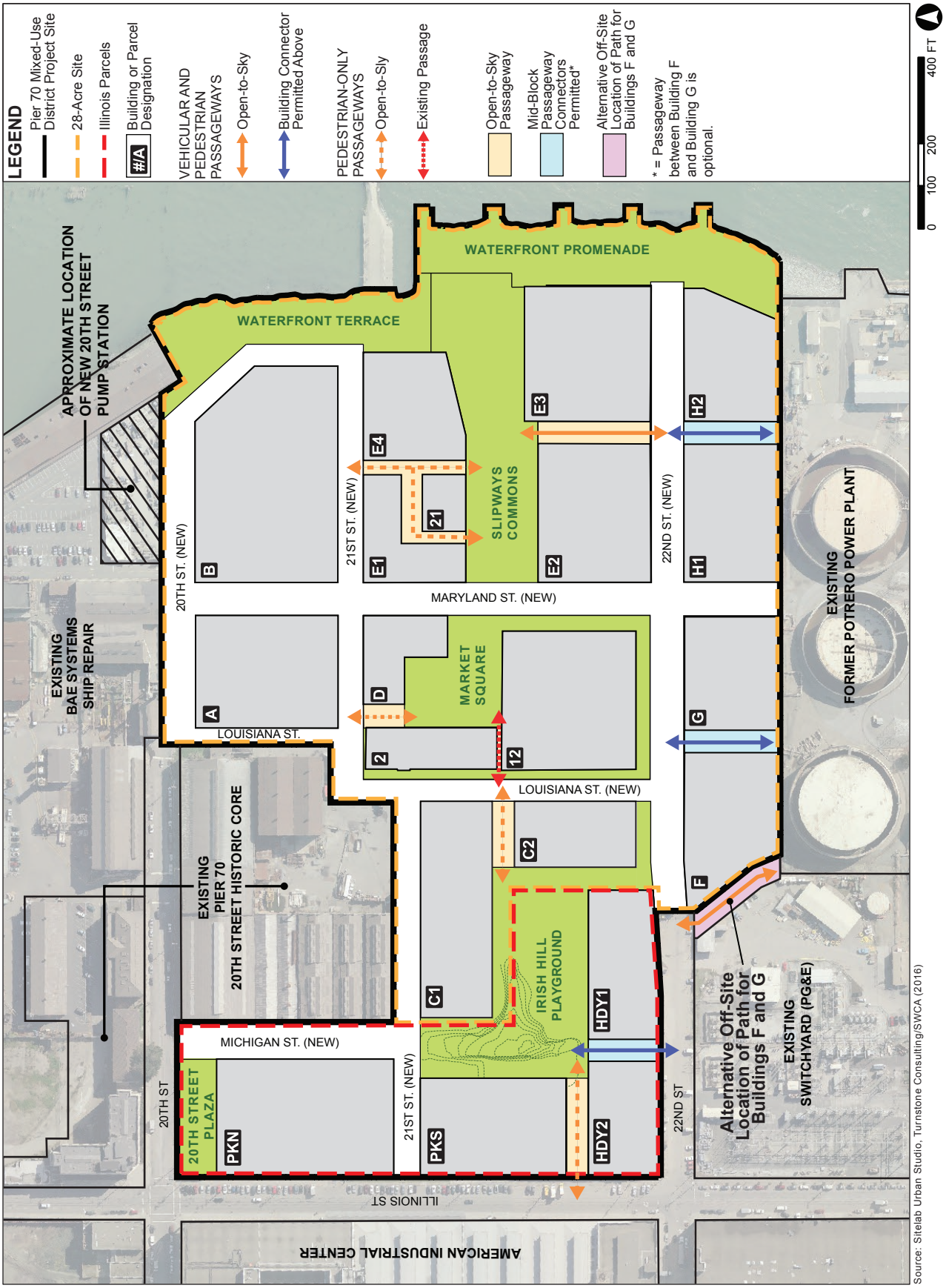
To enhance compatibility of new construction with adjacent contributors to the Historic District, the following materials would be limited on façades of new construction immediately adjacent to contributors to the Historic District: (1) bamboo wood, (2) smooth, flat glass curtain walls, (3) coarse-sand finished stucco, (4) highly reflective glass, and (5) wood resin panels. The following materials would be prohibited on façades of new construction immediately adjacent to the contributing features: (1) vinyl planks and siding, and (2) artificial stone or fiberglass. In addition, building façades finished entirely with solid stucco would not be permitted. Stucco could only be used in combination with other permitted building materials.

Bird-Safe Controls

All new construction façades are subject to the City's Bird Safe Standards for "feature-related hazards." The City's Bird Safe standards for "location-related hazards" shall apply to façades fronting on Irish Hill Playground and façades within 300 feet of and facing San Francisco Bay.

Mid-Block Passages

The Proposed Project includes mid-block passages that would allow for a connector between Parcels F and G, Parcels H1 and H2, and Parcels HDY1 and HDY2, as identified on Figure 2.14: Mid-Block Passageway Locations. The Building Design Standards include standards and guidelines for these connectors to provide for adequate clearance from the ground, maintain visual separateness from the building façade, and maintain a minimum openness to the sky. Since design details for these pedestrian building connectors between these parcels are not decided, the Proposed Project would include a pedestrian passageway option under the Maximum



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.14: MID-BLOCK PASSAGEWAY LOCATIONS

Commercial Scenario. A Pedestrian Passageway Option is not applicable under the Maximum Residential Scenario since mid-block pedestrian passageways are not planned under that scenario. Both the Maximum Commercial Scenario and the Pedestrian Passageway Option would include a 40-foot-wide mid-block pedestrian passage that differentiates building massing in the southern parcels (Parcels F and G, Parcels H1 and H2, and Parcels HDY1 and HDY2). However, the Pedestrian Passageway Option would require that an above-ground building connection over the passageways retain at least 60 percent exposure to the sky, whereas the Maximum Commercial Scenario would require a minimum setback of at least 10 feet with an additional setback of another 10 feet on the upper floor.

Long Façades in Key Locations

The Building Design Standards identify long façades in key locations which would be subject to further architectural requirements beyond the Project-wide Standards. The Building Design Standards identify and illustrate examples of design strategies for long façades in key locations to promote flexibility, variety, creativity, and thoughtfulness in building design. These strategies fall under the categories of large-scale massing, modulation, and fine-grained materiality, described below, and should be used in combination.

Massing

Massing strategies are large urban-scale setback, projections, and interventions that activate public space, respond to historic context, and offer improved views and sun exposure to provide massing variation along the length of the façade. These strategies include ground-floor and base setbacks, upper-level setback, passageways or entryways that subdivide the façade, courtyards and terraces that subdivide the façade, and substantial subtractions or projections to the building envelope.

Modulation

Modulation strategies are occupiable small-scale shifts of the building envelope in order to achieve variation and depth along the length of a façade, such as inset vertical or horizontal bays or shifts in massing, subdividing the façade into two offset façade systems, volumetric façade articulation, and roofline modulation.

Materiality

Materiality strategies identify materials and treatments to be applied to façades. These include preferred façade materials, material treatment, pattern of assembly, façade depth, and shading elements.

Waterfront Façades

The Building Design Standards identify and apply architectural requirements for key waterfront façades. The waterfront façade standards serve to reinforce the following waterfront-specific goals: reinforce the public nature of the waterfront park through the adjacent ground-floor treatments and uses; provide views of the water from the buildings; maximize sunlight on adjacent open spaces; and promote pedestrian scale on the ground floor along the waterfront.

PROPOSED OPEN SPACE PLAN

The Proposed Project would include 9 acres of publicly owned open space. (See Figure 2.15: Proposed Open Space Plan.) The Building Design Standards for the proposed open space plan respond to several key objectives:

> "to connect the Dogpatch neighborhood to the waterfront, to create a variety of vibrant public spaces for social interaction and respite, to enhance the resiliency of the site against sea-level rise, to retain a defining feature of the Historic District open areas, and to project an identity for the site that draws from the character of the adjacent neighborhood and the history of the Pier 70 industrial waterfront."[41]

The proposed open space would supplement recreational amenities in the vicinity of the project site, such as the future Crane Cove Park in the northwestern part of Pier 70, and would include extension of the Blue Greenway[42] and Bay Trail through the southern half of the Pier 70 area.

As described below, open spaces programmed as part of the Proposed Project are the Waterfront Promenade, the Waterfront Terrace, Slipways Commons, the Building 12 Market Plaza and Market Square, the Irish Hill Playground, 20th Street Plaza, and Buildings C1 and C2 structured parking rooftops, if parking structures are built on these parcels. These open spaces are anticipated to accommodate everyday passive uses as well as public outdoor events, including art exhibitions, theater performances, cultural events, outdoor fairs, festivals and markets, outdoor film screenings, evening/night markets, food events, street fairs, and lecture services. Fewer than 100 events per year are anticipated and would likely include approximately 25 mid-size events attracting between 500 to 750 people, and four larger-size events attracting up to 5,000 people.

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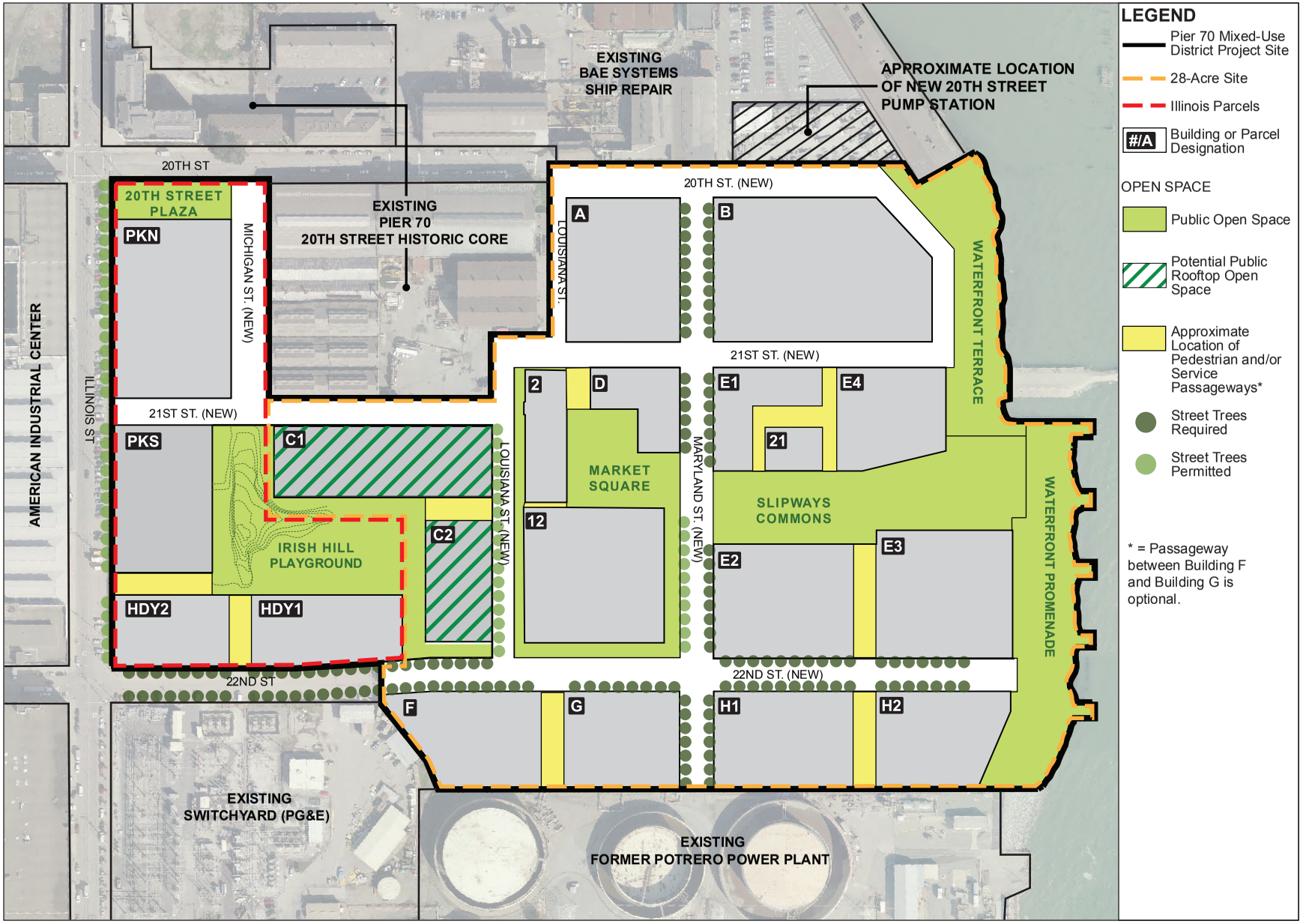
[41] *Draft Pier 70 SUD Design for Development*, April 1, 2016, Section 3.1, "Open Space Vision and Objectives," p. 39.

[42] The Blue Greenway is a City of San Francisco project to improve the City's southerly portion of the 500-mile, 9-county, region-wide Bay Trail, as well as to extend the newly established Bay Trail and associated waterfront open space system. This 13-mile trail corridor will connect China Basin in the north to Candlestick Point State Recreation Area in the south. Trail information is available online at http://www.sf-port.org/index.aspx?page=1433, accessed September 24, 2015.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.15: PROPOSED OPEN SPACE PLAN

The Proposed Project would also include private open space areas such as balconies, rooftops, and courtyards that would be accessible only to building occupants.

WATERFRONT PROMENADE

The Waterfront Promenade would encompass a minimum 100-foot-wide portion of an approximately 5-acre waterfront park area (which also includes the Waterfront Terrace and Slipways Commons open space areas, described below) located along the central and southern shoreline of the project site. The Waterfront Promenade would include a north-south-running pedestrian and bicycle promenade as part of the 20-foot-wide Blue Greenway and Bay Trail system that extends from Mission Creek to the southern San Francisco County line at Candlestick Point. Anticipated features include outdoor dining terraces east of Parcel E3 and H2, and furnished picnic and seating terraces east of Parcels E3 and H2, which would provide park users with opportunities for waterfront viewing and passive recreation. A 6-foot-wide informal shoreline pathway would run parallel to the riprap along the water's edge and would connect the various features at the San Francisco Bay edge. The Pier 70 slipway structures along the water's edge would also be made accessible to the public and would offer opportunities for fishing and views of the San Francisco Bay and Pier 70 historic buildings.

The Proposed Project includes installation of four viewing pavilions along the water's edge. These viewing pavilions are large-scale public art and artifact pieces, which would be designed to emphasize the view of the horizon as well as accommodate a variety of public program uses such as cultural events and gatherings. The Waterfront Promenade includes two of the four viewing pavilions; the remaining two would be installed in the Waterfront Terrace and Slipways Commons, discussed below.

WATERFRONT TERRACE

The Waterfront Terrace would be constructed along the northern half of the project site's shoreline, to the north of the Waterfront Promenade, and orient views towards the active shipbuilding activities north of the project site. The Waterfront Terrace includes three primary spaces: a viewing pavilion to the north, a social lawn along the central portion, and picnicking and seating areas along the southern portion. The Waterfront Terrace would also include the northern portion of the 20-foot-wide Blue Greenway and Bay Trail system within the project site.

SLIPWAYS COMMONS

Slipways Commons open space would connect existing Buildings 2, 12, and 21 to the waterfront. This area would be designed as the most flexible, multi-purpose open space, intended to accommodate community gatherings, festivals, performances, art installations, and nighttime and cultural events, as well as passive recreation. Anticipated features include a multi-function

commons, an event plaza, and a viewing pavilion. No roadway would be permitted between Parcels E1, E2, E3 and E4 and Building 21 and the park, in order to maximize recreational use of the park and encourage pedestrian travel.

BUILDING 12 PLAZA AND MARKET SQUARE

The Building 12 Plaza and Market Square would be a series of small plazas and outdoor market spaces. Market Square would be located directly north of Building 12 and east of Building 2 with four pedestrian access points. The approximately 1.5-acre plaza and square would provide the opportunity for informal and formal events, supporting flexible space for open-air markets, market stalls, and small performances and gatherings. Along the eastern and southern edges of Building 12, small plazas (approximately 26 to 28 feet wide) would provide opportunities for artwork displays, seating, and ground-floor uses within adjacent buildings to extend into these outdoor areas. The southern plaza would also have a café terrace. The Proposed Project would potentially retain a metal-frame remnant of Building 15 above the new 22nd Street, directly south of Building 12.

IRISH HILL PLAYGROUND

The Irish Hill Playground installation would be a 2-acre area south and east of the existing remnant of Irish Hill. The Irish Hill Playground would include children's play areas (play slope and play pad), other recreation opportunities, a picnic grove, a lounging terrace, and planted slopes and pathways. The non-native stand of eucalyptus trees located on the remnant of Irish Hill would remain.

20TH STREET PLAZA

The 0.5-acre 20th Street Plaza open space area would be located at the southeast corner of the intersection of 20th and Illinois Street streets, directly north of Parcel PKN. This gateway space would allow for direct views from 20th and Illinois streets to Building 113, on the Historic Core site. Potential features within the 20th Street Plaza include terraced seating areas and stormwater management facilities.

ROOFTOP OPEN SPACE AREAS

As described above, Parcels C1 and C2 would be designated for parking structures, but could be developed with either residential or commercial uses, depending on future market demand for parking and travel patterns. If parking structures are constructed on those parcels, the rooftops would be used to provide additional public open space and amenities such as active sports courts and play fields, community gardens, seating, and observational terrace areas. This acreage would be in addition to the 9 acres of public open space proposed at the project site.

PROPOSED TRAFFIC AND CIRCULATION PLAN

OVERVIEW

The Proposed Project would encourage alternative modes of transportation (transit, walking, and biking) by building a dense, pedestrian friendly, mixed-use, and transit-oriented development; using Transportation Demand Management (TDM) strategies;[43] prioritizing safety, especially for bicyclists and pedestrians; implementing a shuttle bus service to connect Pier 70 to regional transit hubs; and establishing a bicycle share system. The TDM strategies would be presented in a section of the *Pier 70 SUD Transportation Plan*. Entitlement and transaction documents would require the Proposed Project to establish a Transportation Management Agency (TMA) to coordinate and implement TDM measures, including the shuttle service.

STREET IMPROVEMENTS AND CIRCULATION

As shown on Figure 2.16: Proposed Roadway Network, the proposed primary streets on the project site would be 20th and 22nd streets, built out from west to east. The proposed Maryland Street would be a secondary north-south-running street designed as a shared street.[44] New minor streets proposed as part of the Proposed Project include a new 21st Street, running west to east from Illinois Street to the waterfront, and Louisiana Street, running north from 22nd Street. New traffic signals would be installed at the intersection of Illinois and 21st streets. Louisiana Street from 21st Street to 20th Street would include a jog to accommodate existing historic structures within the Historic Core. Except for the western side of Louisiana Street adjacent to the Historic Core, all proposed streets would include sidewalks, and street furniture where appropriate. Maryland, 20th, and 22nd streets would include bicycle infrastructure or signage. With the exception of Louisiana Street between 20th and 21st streets, all proposed streets would be two-way, with a single lane of travel in each direction. Louisiana Street would be one-way in the southbound direction, with a single lane of travel. The Proposed Project does not include bus or truck routes, although buses could be accommodated in the future. The proposed new streets would provide access for emergency vehicles and off-street freight loading. Michigan, Louisiana, and 21st streets would be designed as primary on-street loading corridors.

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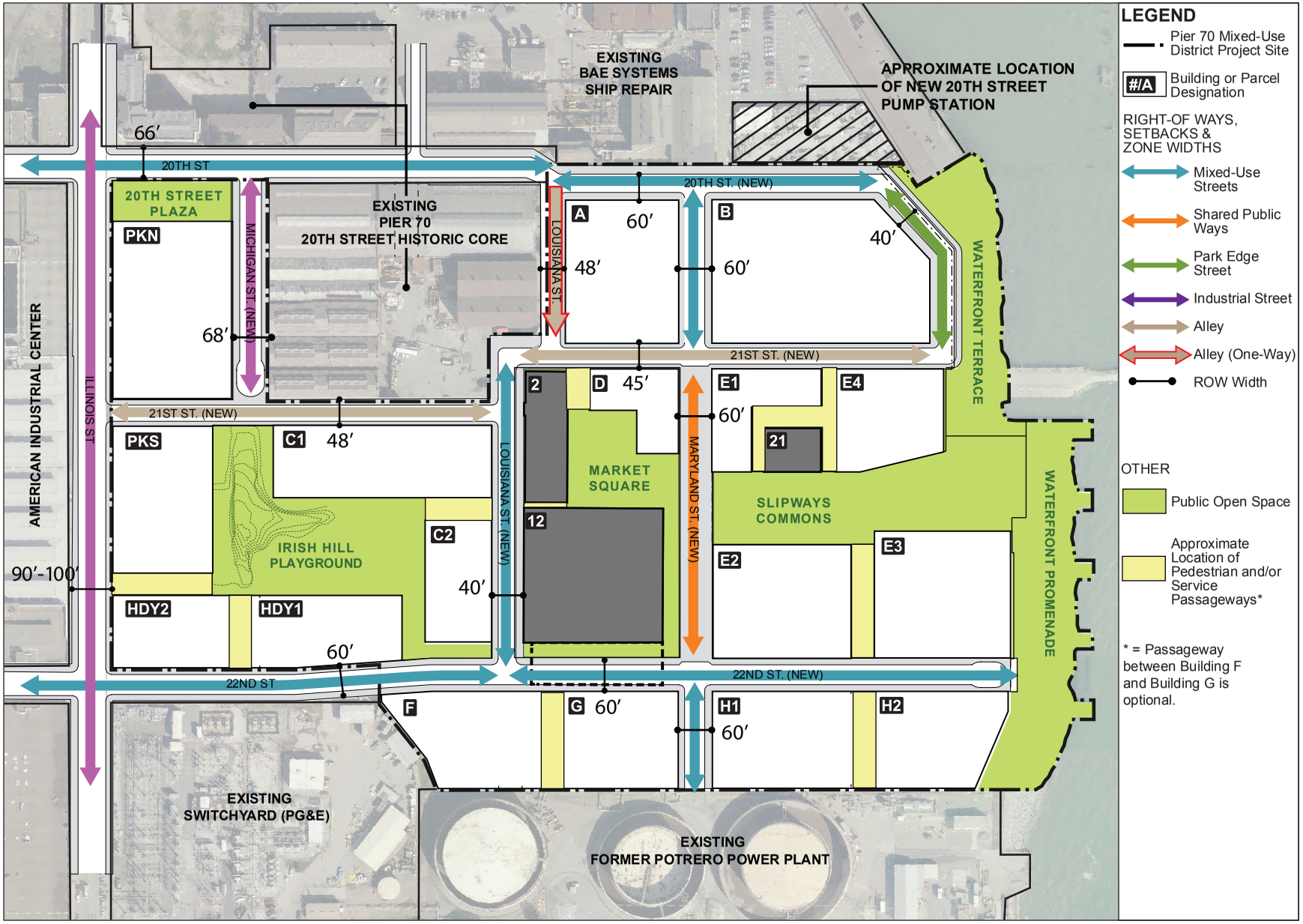
[43] Transportation Demand Management is the application of strategies and policies to reduce travel demand (specifically that of single-occupancy private vehicles), or to redistribute this demand in space or in time.

[44] Shared streets are generally curbless streets that maintain driveway-like access for vehicles operating at low speeds to provide necessary services and are designed to prioritize pedestrian travel by implicitly slowing traffic speeds using design features, and other cues to slow or divert traffic.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

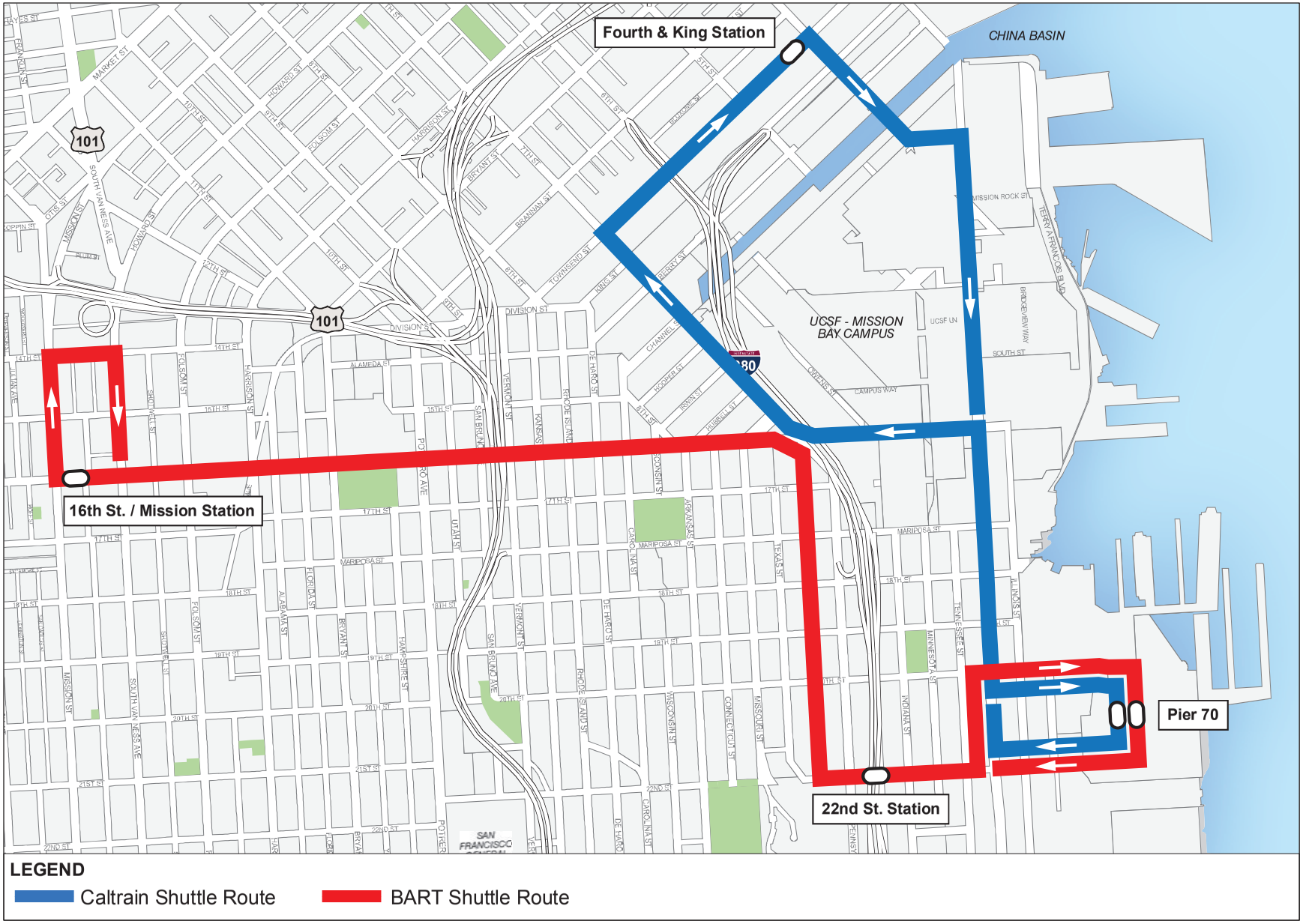
FIGURE 2.16: PROPOSED ROADWAY NETWORK

As part of the Proposed Project, Michigan Street from the southern side of 20th Street towards 21st Street would be narrowed from 80 to 68 feet with 12 feet of the right-of-way converted from a public street to private use, i.e., "vacated," and developed as part of the Illinois Parcels. Vehicle travel would not be connected through to 21st Street due to a grade change, but pedestrian pathways would connect.

TRANSPORTATION PLAN

The Proposed Project would include a *Pier 70 SUD Transportation Plan* intended to manage transportation demands and to encourage sustainable transportation choices, consistent with the City of San Francisco's Transit First, Better Streets, Climate Action, and Transportation Sustainability Plans and Policies. The *Pier 70 SUD Transportation Plan* would include a TDM Program that would establish a TMA to manage implementation of TDM measures at the site. The TMA for the Proposed Project would be funded by project-generated sources and would be responsible for working with future subtenants of the project site (e.g., employers, residents, etc.) to ensure that they are actively participating in the TDM program. The TMA would be managed by a Transportation Coordinator who would oversee implementation of the TDM Program.

Key strategies to be included in the TDM Program would be a shuttle service, bike sharing stations and other means of encouraging bicycle use, unbundled parking, car-sharing services, and other approaches to discourage use of single-occupant private vehicles. The shuttle service would connect residents and workers to regional transit hubs, such as the 16th/Mission BART station, the 22nd Street Caltrain station, and the Caltrain station at Fourth and King streets. (See Figure 2.17: Proposed Shuttle System.) Routes, vehicle size, and frequency would be augmented over the course of build-out of the Proposed Project to respond to demand. The shuttle service would be operated by the TMA, with no fee, most likely through a third-party service provider. It would enroll in the SFMTA Commuter Shuttle Program and be subject to that Program's policies, including establishing specific designated locations for pick-up and drop off, and only using shuttle vehicles which comply with the 2012 California vehicle emissions standards. The Proposed Project would establish a bicycle sharing system to work collaboratively with SFMTA and Bay Area Bike Share (BABS) representatives or a similar bicycle sharing service. Through the TMA, the Proposed Project would implement a number of amenities and education strategies regarding transportation choices, including real-time occupancy data for shared parking facilities, on-street carshare spaces, unbundled parking for residents, preferential treatment for high-occupancy vehicles, a website, production of brochures and newsletter, as well as a dedicated Transportation Coordinator staff member. See "Transportation Demand Management Plan" in Section 4.E, Transportation and Circulation, pp. 4.E.46-4.E.47, for a more thorough discussion of TDM Plan strategies.



Source: Forest City (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.17: PROPOSED SHUTTLE SYSTEM

BICYCLE AND PEDESTRIAN IMPROVEMENTS

The Proposed Project includes bike lanes, bike-safety-oriented street design, and bike-parking facilities to promote bicycling in and around the project site. (See Figure 2.18: Proposed Bicycle Network.) Under the provisions of the SUD, bike amenities would be constructed on the project site that would meet or exceed the existing Planning Code requirements at the time of permit submittal.[45] Under the Maximum Residential Scenario, 1,142 Class 1 and 514 Class 2 bicycle parking spaces would be required.[46] Sufficient Class 2 bicycle parking should also be provided at key entrance areas of the major open spaces. Under the Maximum Commercial Scenario, 995 Class 1 and 475 Class 2 bicycle parking spaces would be required. Improvements proposed for the Proposed Project include construction of Class II facilities (bicycle lanes) and Class III facilities (shared-lane markings and signage) on 20th, 22nd, and Maryland streets. A Class I separated bicycle and pedestrian facility would be provided along the Bay Trail and Blue Greenway the length of the project site along the shoreline, connecting at Georgia Street to the northbound path to Crane Cove Park and the southern waterfront park boundary to the future southern connection through the former Potrero Power Plant site.

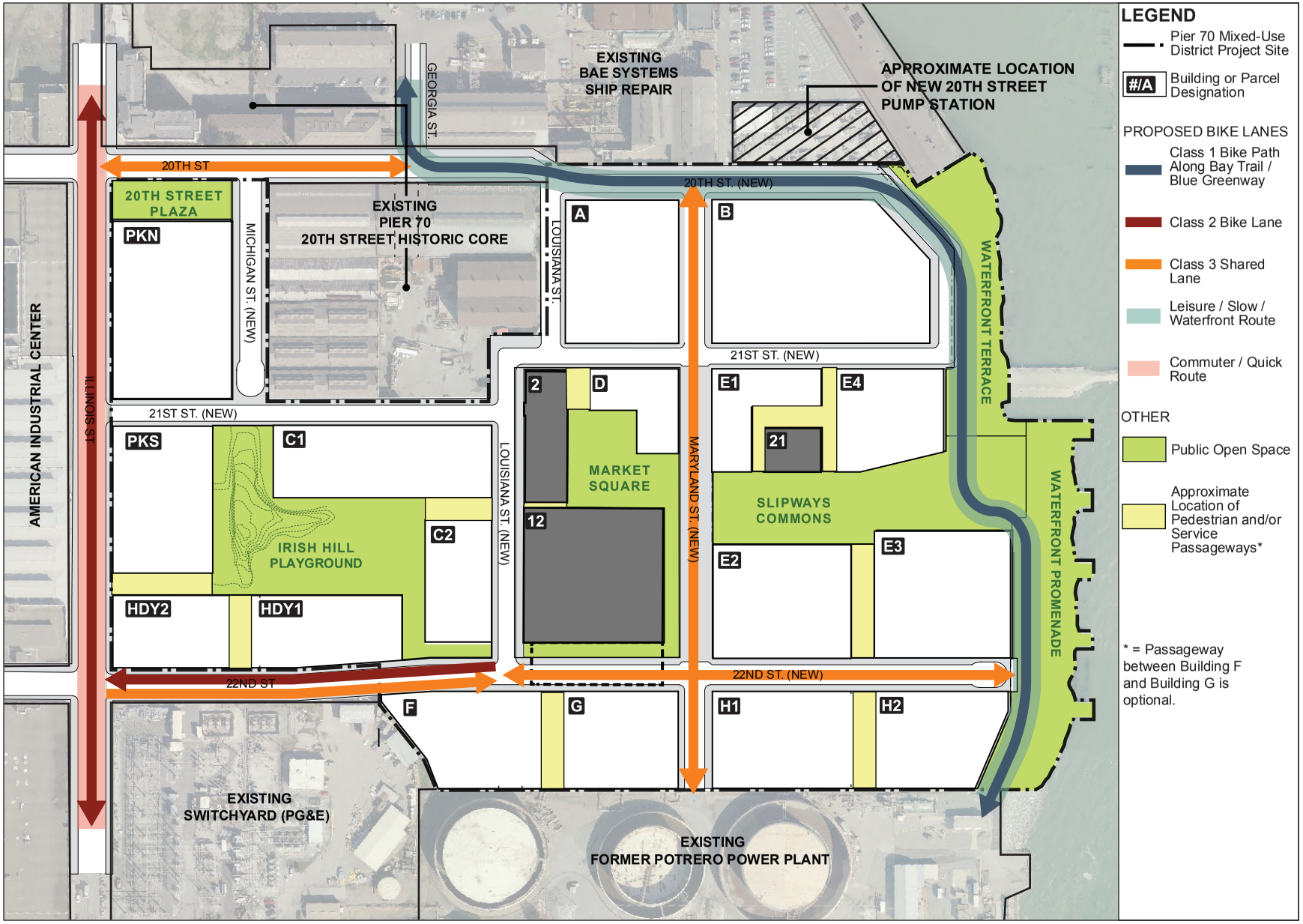
Pedestrian travel would be encouraged throughout the project site by establishing a network of connected pedestrian pathways running both west-to-east and north-to-south to connect open spaces. Street and open space design would also incorporate pedestrian-safe sidewalk and street design and signage. All streets on the project site would include 9- to 18-foot-wide sidewalks. The project site is designed to make the area east of Maryland Street a predominantly pedestrian zone, and there would be no vehicular streets along the length of waterfront parks, with the exception of the north-south running portion of 20th Street. Maryland Street could potentially have a shared street condition, to reinforce the pedestrian connection from the western portion of the site, across the street, and to San Francisco Bay. Both 20th and 22nd streets would feature pedestrian amenities to encourage walking from the Dogpatch neighborhood, as well as transit use along the Third and 22nd streets corridors.

PARKING

The Proposed Project would provide parking spaces within a site-wide maximum and a maximum ratio per use. Under the Maximum Residential Scenario a maximum of 3,370 off-street parking spaces would be allowed, and under the Maximum Commercial Scenario a maximum of 3,496

[45] Current Planning Code bicycle requirements at the time of publication of the Draft EIR are set forth in San Francisco Planning Code Section 155.2, available online at: http://planning.sanfranciscocode.org/1.5/155.2/. Accessed June 30, 2016.

[46] Class 1 bicycle parking provides lockers, monitored bike parking, or other restricted-access facilities. Class 2 bicycle parking is unprotected bike racks.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

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FIGURE 2.18: PROPOSED BICYCLE NETWORK

off-street parking spaces would be allowed. The Proposed Project would provide about 285 on-street parking spaces along most the streets internal to the project site under either scenario. One parking space per 1,000 square feet of gross floor area would be provided for office/commercial and RALI uses, and 0.75 parking spaces per residential unit would be allowed. If not developed as residential or commercial uses, planned structured parking on Parcels C1 and C2 would provide shared parking for multiple uses. The Illinois Parcels and most parcels on the 28-Acre Site, excluding Buildings 2, 12, and 21, would also have accessory parking. All residential parking would be unbundled, which means parking would be an optional, additional cost to the price of renting or purchasing a dwelling unit.

PROPOSED INFRASTRUCTURE AND UTILITIES

POTABLE WATER

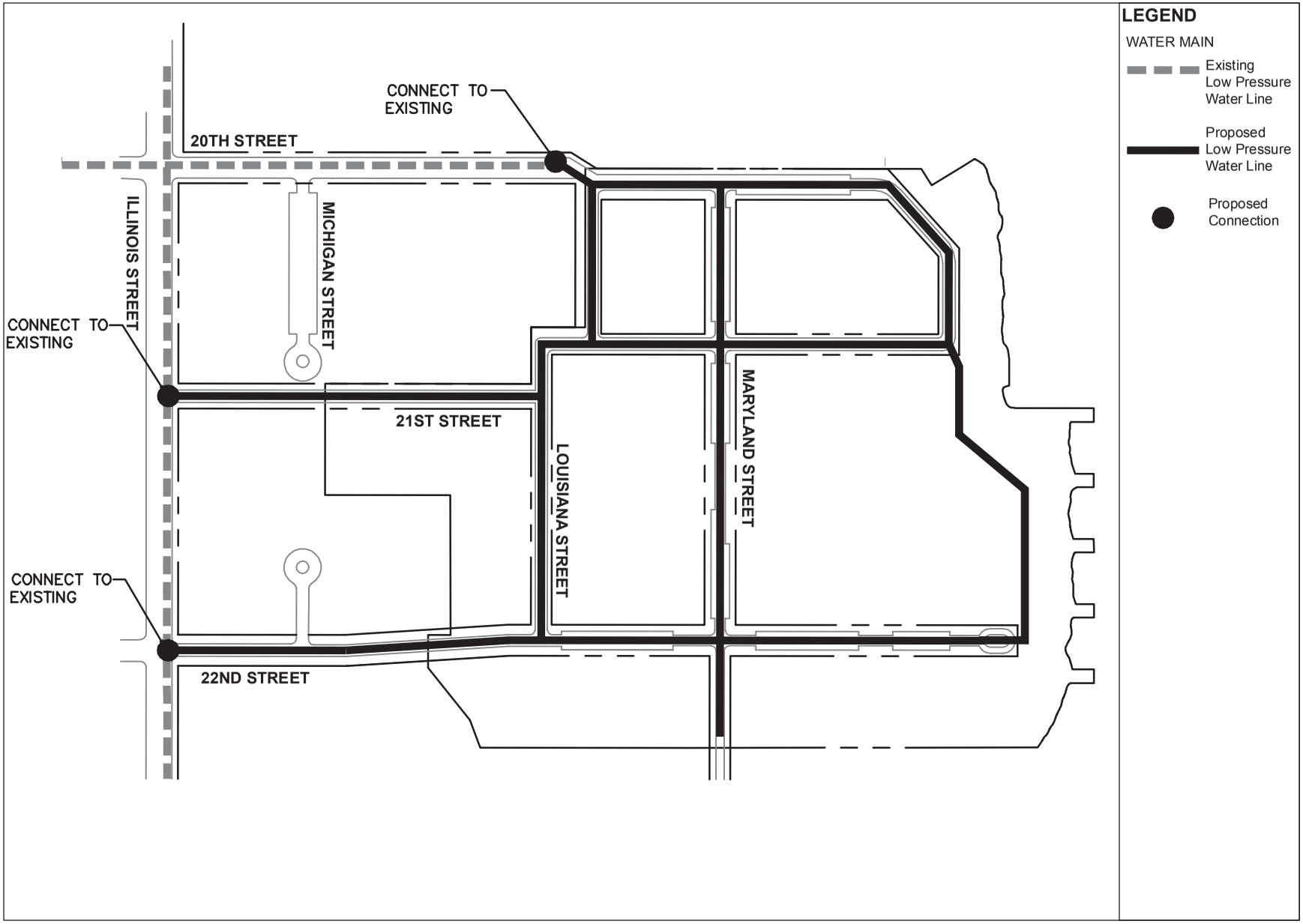
Potable water distribution piping would be constructed in trenches under the planned streets to provide water for site uses and firefighting needs. This piping would connect to the existing water mains of the City's low-pressure water distribution system underneath 20th, Illinois, and 22nd streets. (See Figure 2.19: Proposed Low Pressure Water Distribution System.) Connections to existing water mains would be made at the intersections of Illinois/22nd streets, Illinois/21st streets, and at the intersection of 20th and Louisiana streets.[47] If necessary, the water main underneath the western portion of 20th Street would be replaced. To reduce potable water demand, high-efficiency fixtures and appliances would be installed in new buildings, and fixtures in existing buildings would be retrofitted, as required by City regulations.

RECYCLED (RECLAIMED) WATER

The project site is located within the City's designated recycled water use area and is subject to Article 22 of the San Francisco Public Works Code, referred to as the Recycled Water Use Ordinance. The goal of the ordinance is to maximize the use of recycled water. Therefore, buildings and facilities that are subject to this ordinance must use recycled water for all uses authorized by the State once a source of recycled water is available and projects must include recycled water distribution systems within buildings as well as throughout the project sites. Commonly approved uses include irrigation, cooling, and toilet and urinal flushing.

The SFPUC's Eastside Recycled Water Project may ultimately provide an estimated 2 mgd of tertiary recycled water on the eastern side of San Francisco. However, the Eastside Recycled Water Project is in the planning stages, with construction expected to be completed by the end of

[47] BKF, Pier 70, Proposed Utilities, Low Pressure Water System diagram, February 26, 2015.



Source: BKF (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.19: PROPOSED LOW PRESSURE WATER DISTRIBUTION SYSTEM

2029.[48] Although a source of recycled water is not yet available from the City, the project sponsors would install distribution pipelines to ultimately connect with the City's recycled water distribution system once it is constructed. Accordingly, the Proposed Project includes the installation of distribution pipelines beneath existing and proposed streets within the project area, as shown on Figure 2.20: Proposed Recycled Water Distribution System. These lines would temporarily connect to the in-City, low-pressure water system at the intersection of 22nd and Illinois streets and the intersection of 20th and Louisiana streets. Backflow prevention devices would be installed at each connection to prevent backflow from the recycled water system to the potable low-pressure water system. Once the City's recycled water system is constructed, the Proposed Project's recycled water pipelines would connect to the City's recycled water system.

ON-SITE NON-POTABLE WATER

San Francisco's Non-potable Water Ordinance requires new buildings larger than 250,000 square feet to use on-site "alternate water sources" of graywater (e.g., wastewater from bathtubs, showers, bathroom sinks, and clothes washing machines, but not from kitchen sinks, dishwashers or toilets), rainwater (e.g., precipitation collected from roofs and other above-ground collection surfaces, excluding stormwater runoff), and foundation drainage water (e.g., nuisance groundwater that is pumped out to maintain a building's or facility's structural integrity) to meet that building's toilet and urinal flushing and irrigation demands.[49] The Proposed Project would include the diversion and reuse of graywater and rainwater for toilet and urinal flushing and irrigation.

AUXILIARY WATER SUPPLY SYSTEM

To meet supplemental firefighting water requirements for the AWSS, the Proposed Project would be required to include on-site AWSS high-pressure distribution piping. This network of high-pressure pipelines would connect to the existing AWSS distribution pipeline in Third Street. The pipelines would be installed beneath existing and proposed streets and would supply fire hydrants within the project site for the purposes of firefighting. The AWSS may also include a permanent manifold installed upland of the shoreline that can be connected to a temporary, portable submersible pump for redundancy.

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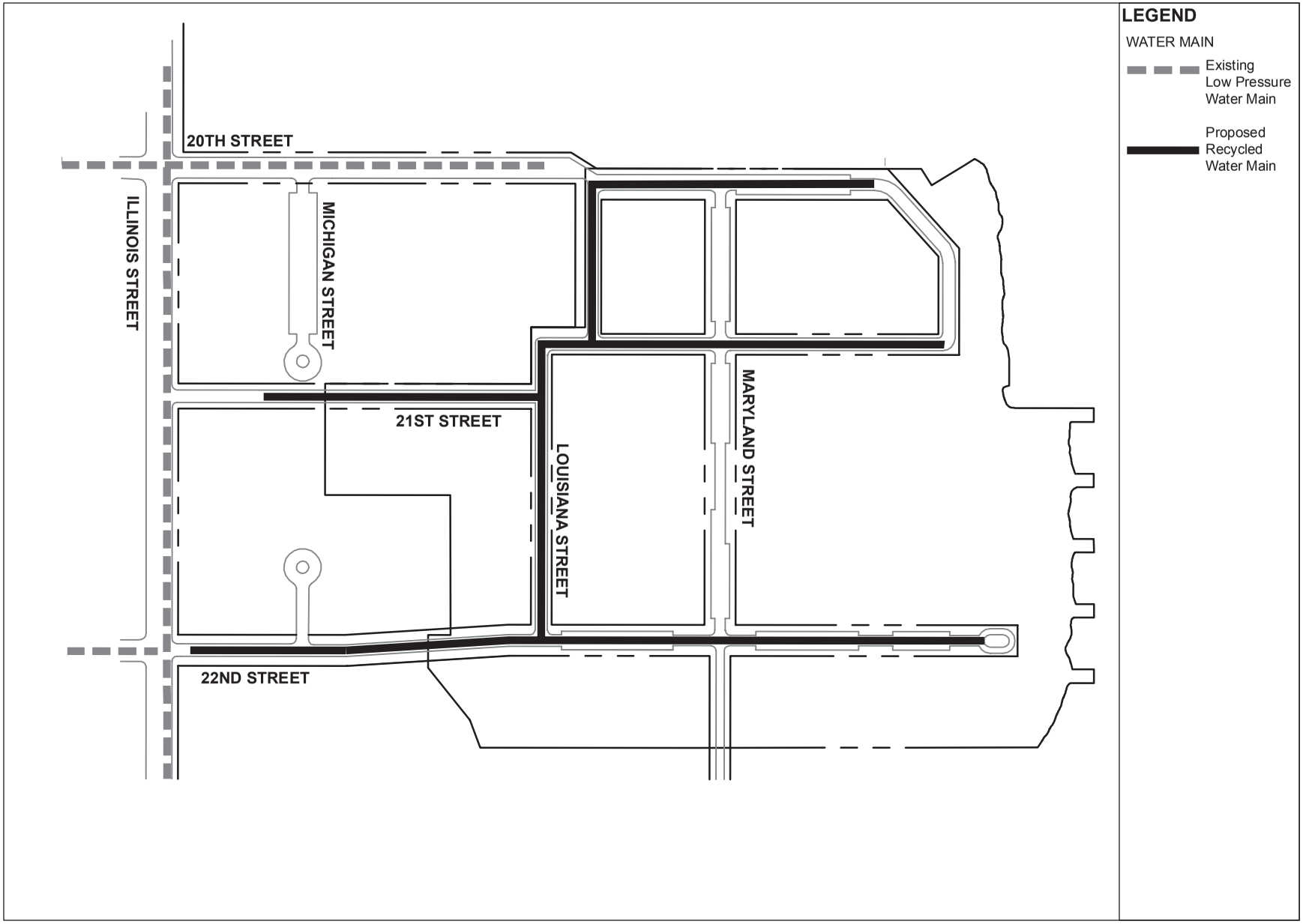
[48] SFPUC, *San Francisco Eastside Recycled Water Project*. Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=311. Accessed December 29, 2015.

[49] City and County of San Francisco Ordinance 109-15, "Health, Public Works Codes - Mandatory Use of Alternate Water Supplies in New Construction" (June 15, 2015), amending San Francisco Health Code section 12C.2.



Source: BKF (2015)

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FIGURE 2.20: PROPOSED RECYCLED WATER DISTRIBUTION SYSTEM

PROPOSED WASTEWATER (SANITARY SEWER) AND STORMWATER FACILITIES

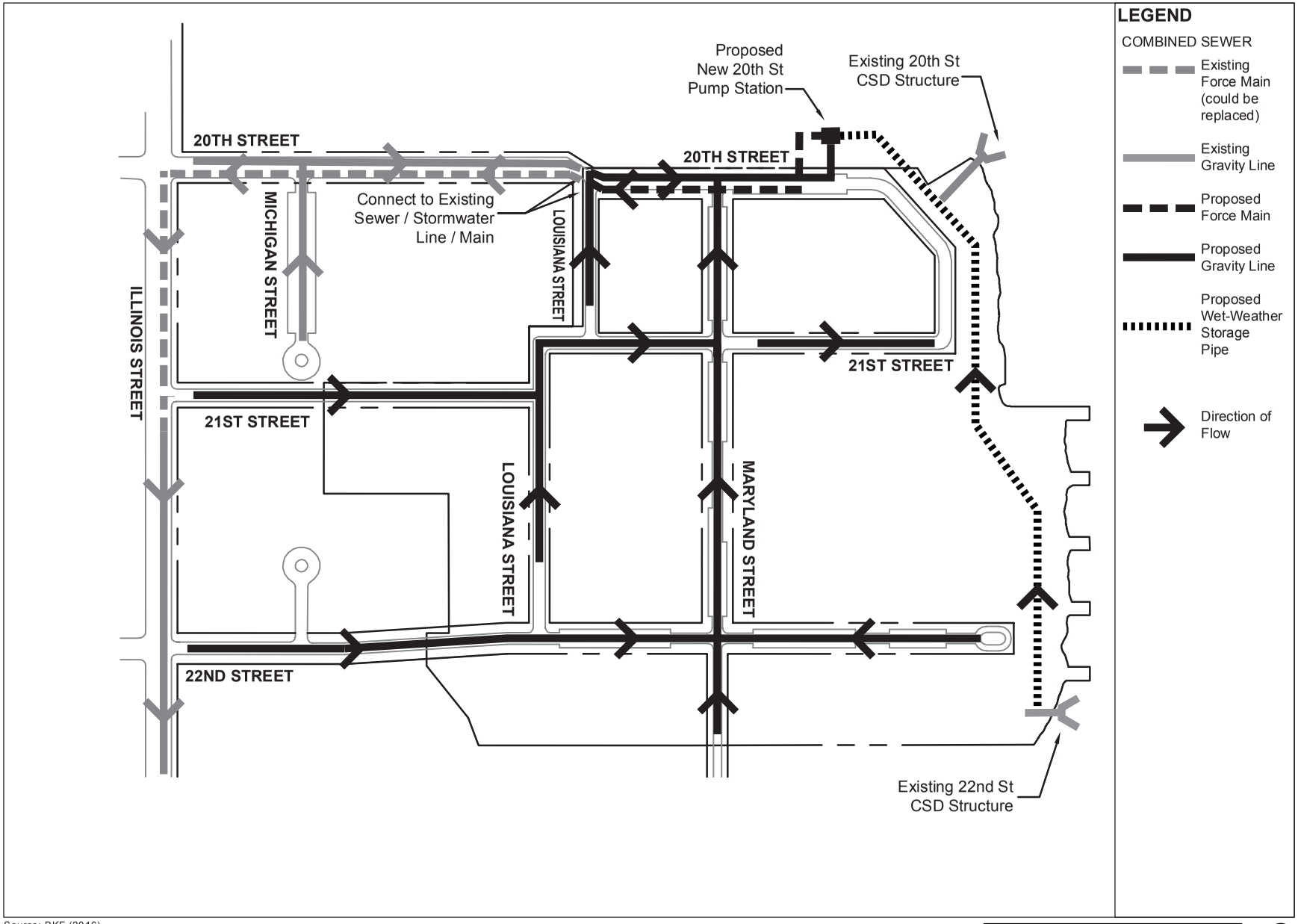
As described under "Infrastructure" on pp. 2.19-2.20, wastewater and stormwater flows from the project site are currently conveyed to the SEWPCP for treatment via the City's combined sewer system. The Port also owns and maintains many gravity sewer lines that connect the existing buildings on the site to the SFPUC sewer lines.

The project sponsors are considering three options for managing wastewater and stormwater flows from the project site: Option 1, Combined Sewer System; Option 2, Separate Wastewater and Stormwater Systems; and Option 3, Hybrid System. These options are described below. Stormwater and wastewater system improvements common to each option are described first, followed by improvements that are specific to each option.

Common Improvements

Under all of the wastewater and stormwater management options, the Proposed Project would replace SFPUC's 20th Street Pump Station to accommodate the existing stormwater and wastewater flows within the 20th Street sub-basin along with anticipated wastewater flows from the project site and future development in the 20th Street sub-basin. The new 20th Street Pump Station would be located on Port lands, likely at a location immediately north of the project site boundary, between Buildings 6 and 108 on or near the BAE Systems Ship Repair site, as shown on Figure 2.21: Option 1 – Combined Sewer System. The new 20th Street Pump Station would include the following features, which would be refined during the detailed design phase of the Proposed Project in coordination with the SFPUC:

- The pump station structure and ancillary equipment such as the electrical control panel, and electrical transformer would likely be constructed within an approximately 50-by-60-foot area that would be fenced and allow for vehicular maintenance access. The control panel could be exposed or enclosed within an approximately 15-by-30-foot structure about 10 feet in height.
- A 30-by-30-foot wet well would be constructed to a depth of approximately 20 feet below grade. All of the pumps, valves, and associated mechanical equipment would be enclosed below ground in the wet well and valve vault structures.
- The pump station would be elevated to accommodate a minimum of 66 inches (5.5 feet) of sea level rise above the present day 2000 mean high water line, and would be designed to meet City design guidelines and limit combined sewer discharges into San Francisco Bay, in conformance with the City's permit requirements through a combination of overflow weirs, sump pumps, and upstream hydraulic systems.



Source: BKF (2016)

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FIGURE 2.21: OPTION 1 - COMBINED SEWER SYSTEM

It is possible that, in conjunction with installation of the new pump station, a new force main would be constructed to replace all or part of the existing 10-inch force main. The new force main would be installed beneath 20th Street and a portion of Illinois Street to convey flows from the new pump station to the existing 27-inch-diameter gravity sewer main of the City's combined sewer system beneath Illinois Street, as shown on Figure 2.21. In addition, the existing 900-foot-long, 54-inch storage and detention pipe would be replaced and relocated to an area beneath the proposed Waterfront Terrace and Waterfront Promenade, also as shown on Figure 2.21. Similar to existing conditions, the storage and detention pipe would be connected to the existing 20th and 22nd streets CSD outfalls and the storage capacity provided by this pipe, the 42-inch sewer line beneath 20th Street, and the wet well of the 20th Street Pump Station would be used to control the frequency of CSDs from the 20th Street sub-basin. The BAE line connecting to the pump station would be relocated or extended as part of the Proposed Project. All of the Port gravity sewer lines within the project site would also be removed.

The dry-weather capacity of the new pump station and force main would be sufficient to convey the total of all peak dry-weather flows to the 27-inch sewer line of the combined sewer system in Illinois Street. The wet weather capacity of the pump station and storage facilities would be sufficient to ensure that wet-weather combined sewer discharges from the 20th Street sub-basin do not exceed a long-term average of 10 combined sewer discharges per year in accordance with the Bayside NPDES Permit, or contribute to an increase in CSDs from other drainage basins of the combined sewer system that would exceed the long-term average specified in the Bayside NPDES permit. The SFPUC would participate in the design of the new 20th Street Pump Station to ensure these performance criteria are achieved.

Wastewater and Stormwater Flow Options

Three stormwater and wastewater options, described below, are under consideration for implementation under the Proposed Project. For each option, the project sponsors would install the pipelines in trenches beneath the Proposed Project's roadway and open space network. Only one of these options would be implemented, and none of the proposed variants to the Proposed Project, described below in Section E, Project Variants, pp. 2.74-2.79, would change the conceptual description of any of the options under consideration. Under each option, the wastewater flows for each of the three options would be conveyed to the SEWPCP for treatment in accordance with the existing Bayside NPDES Permit. The options differ in the way that stormwater would be managed at the project site.

Option 1: Combined Sewer System

Under Option 1, the project sponsors would construct the new combined sewer lines beneath existing and proposed streets to convey both wastewater and stormwater flows to the new 20th

Street Pump Station. The combined flows would be conveyed from the pump station to SFPUC's gravity sewer beneath Illinois Street via the existing 10-inch force main or a new force main installed concurrently with the 20th Street Pump Station, if replacement of the existing force main is required. (See Figure 2.21, p. 2.60.) The storage capacity provided by the 42- and 54-inch storage and detention pipelines along with the wet well of the 20th Street Pump Station would be used to help control the frequency of CSDs from the 20th Street sub-basin.

Option 2: Separate Sewer and Stormwater System Option (Separated Approach)

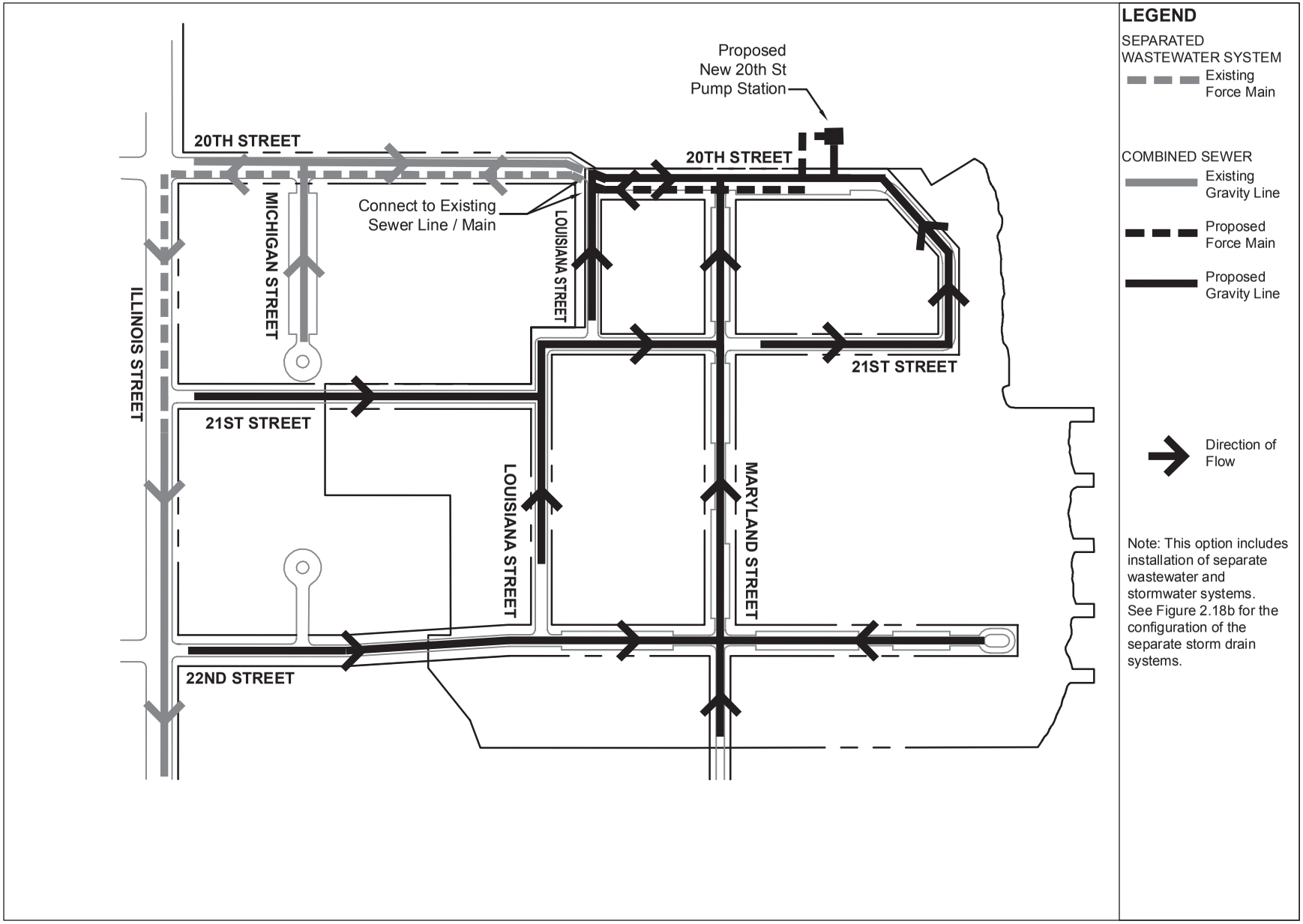
Under Option 2, Separate Wastewater System and Stormwater System, wastewater and stormwater would be conveyed in separate wastewater and stormwater systems. (See Figure 2.22: Option 2 – Separate Wastewater System, and Figure 2.23: Option 2 – Separate Stormwater System.) For the wastewater system, the project sponsors would construct new wastewater lines beneath existing and proposed streets to convey wastewater flows to the new 20th Street Pump Station. Wastewater flows would continue to be conveyed to the City's combined sewer system via the existing 10-inch force main or a new force main installed concurrently with the 20th Street Pump Station, if required.

For the stormwater system, the project sponsors would install new storm drain lines beneath existing and proposed streets to convey stormwater flows via gravity to a new outfall located near the foot of the realigned 21st Street. The new outfall would discharge stormwater to the Central Basin of Lower San Francisco Bay. The separate stormwater system would be considered a Small Municipal Separate Storm Sewer System and would be managed in accordance with the SWRCB Small MS4 General Stormwater Permit, described in Section 4.O, Hydrology and Water Quality.

Option 3: Combined Sewers with Separate Sewer in Eastern Portion of Project Site (Hybrid Approach)

Under Option 3, Hybrid System, a combined sewer system would continue to serve most of the project site, except for the area to the east of the proposed Maryland Street. (See Figure 2.24: Option 3 – Hybrid System.) The project sponsors would construct new separate stormwater and wastewater systems to serve the portion of the project site to the east of Maryland Street, including proposed open space areas.

In the area west of the proposed Maryland Street, the project sponsors would construct new combined sewer lines beneath the existing and proposed streets to convey both stormwater and wastewater flows to the new 20th Street Pump Station. The combined flows from this portion of the site would continue to be conveyed to the City's combined sewer system via the existing 10-inch force main or a new force main installed concurrently with the 20th Street Pump Station, if



Source: BKF (2015)

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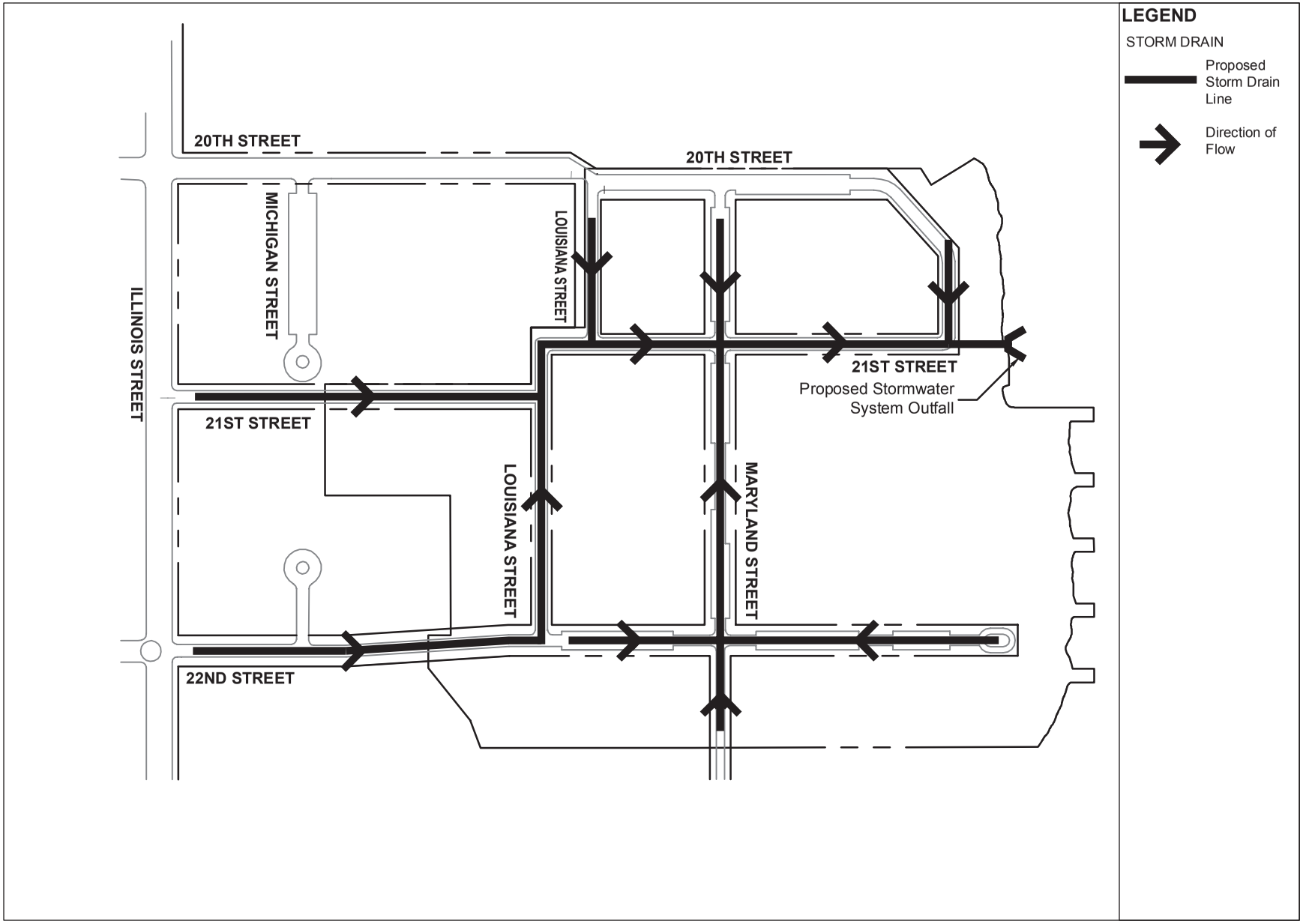
FIGURE 2.22: OPTION 2 - SEPARATE WASTEWATER SYSTEM



Source: BKF (2015)

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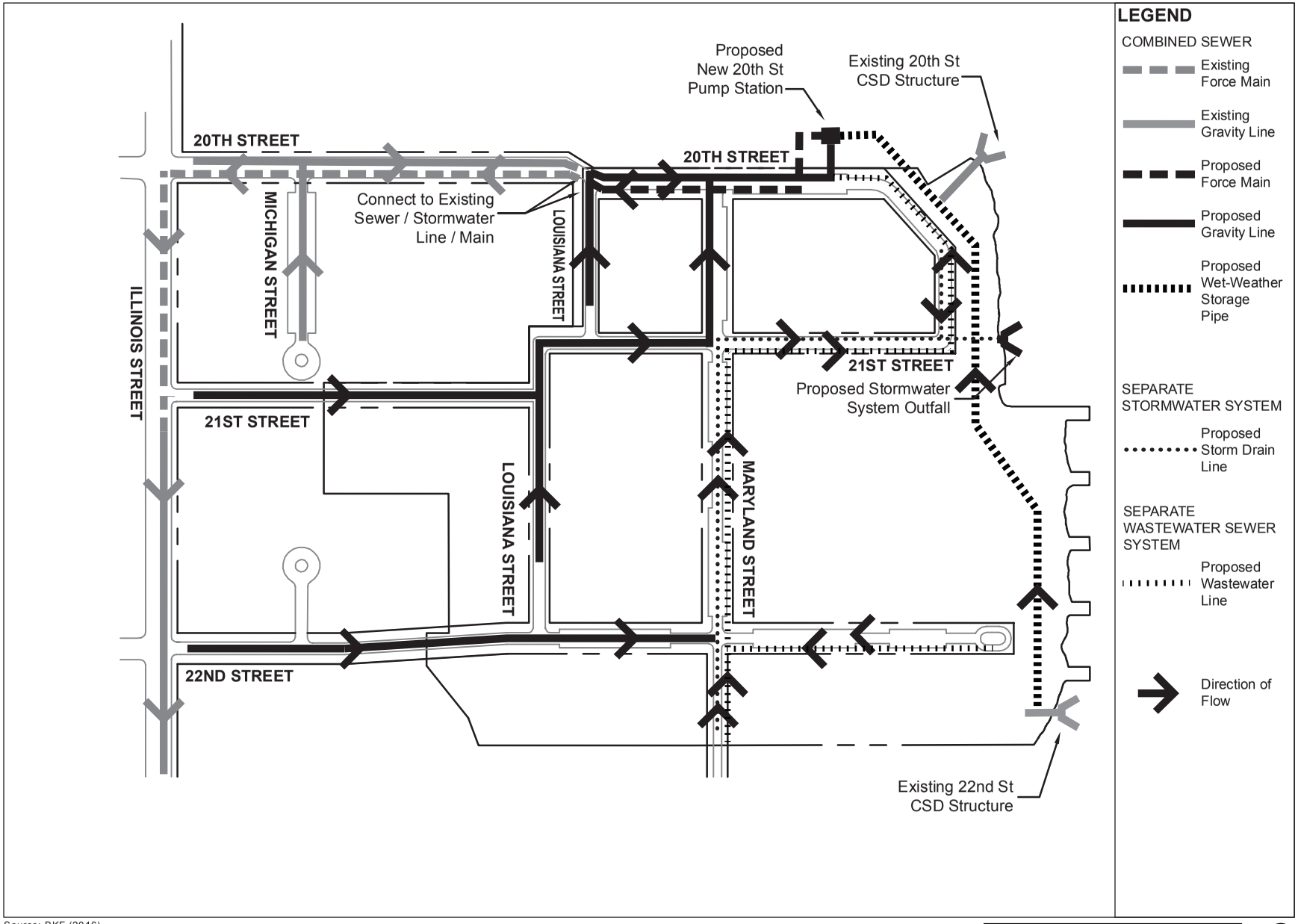
FIGURE 2.23: OPTION 2 - SEPARATE STORMWATER SYSTEM



Source: BKF (2016)

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FIGURE 2.24: OPTION 3 - HYBRID SYSTEM

replacement of the existing force main is required. The storage capacity provided by the 42- and 54-inch storage and detention pipelines along with the 20th Street Pump Station's wet well would be used to help control the frequency of CSDs from the 20th Street sub-basin.

In the area east of the proposed Maryland Street, the project sponsors would construct new storm drain lines beneath the existing and proposed streets to convey stormwater flows via gravity to a new outfall located near the foot of the realigned 21st Street. The new outfall would discharge stormwater to the Central Basin of Lower San Francisco Bay. This separate stormwater system would be considered a Small Municipal Separate Storm Sewer System and would be managed in accordance with the Small MS4 General Stormwater Permit, described in Section 4.O, Hydrology and Water Quality. The project sponsors would also construct new wastewater lines beneath the same streets. Wastewater flows would be conveyed to the new 20th Street Pump Station. Under this option, all wastewater flows from the project site would continue to be conveyed to the City's combined sewer system via the 10-inch force main or a new force main installed concurrently with the 20th Street Pump Station, if replacement of the existing force main is required. The wastewater flows would be conveyed to the SEWPCP for treatment in accordance with the existing Bayside NPDES Permit.

Electricity and Natural Gas

The Proposed Project would replace overhead electrical distribution with a joint trench utilities distribution system which would follow the proposed realigned roadways. Connecting to the existing 12-kV electricity lines along Illinois, 20th, and 22nd streets, the new electric piping would be within placed within the joint trench system to serve each parcel on the project site.

The Proposed Project would also extend the existing natural gas distribution system from 20th Street to connect to the 28-Acre Site. A new natural gas distribution system would be constructed to extend to the Illinois Parcels. New gas lines would be placed in the joint utilities trench distribution system following the realigned roadways.

The Proposed Project would comply with San Francisco Green Building Requirements for energy efficiency in new buildings. Energy-efficient appliances and energy-efficient lighting would be installed in the three rehabilitated historic buildings.

Back-up emergency diesel generators are required by the San Francisco Building Code for new buildings with occupied floor levels greater than 75 feet in height. There are 10 parcels (all in the 28-Acre Site) that would allow building heights of up to 90 feet: Parcels A, B, C1, C2, D, E1, F, G, H1, and H2. Each of the buildings on Parcels A, C1, C2, D, E1, F, G, H1, and H2 would have a back-up diesel generator, if built with occupied floor levels greater than 75 feet; such generators would operate in emergency situations, each having an average size of 400 horsepower. Due to

the larger size of Parcel B, the building proposed for that parcel would have two 400-horsepower, back-up diesel generators to operate in emergency situations. In total, 11 generators are anticipated on the project site.

As part of the necessary mechanical equipment, the Proposed Project includes installation of mechanical cooling towers located on the roof of each proposed building.

Renewable Energy

The Proposed Project is required to meet the State's Title 24 and the San Francisco Green Building Requirements for renewable energy and the Better Roof Requirements for Renewable Energy Standards.[50,51] The Proposed Project would allow for roof-mounted or building-integrated solar photovoltaic (PV) systems and/or roof-mounted solar thermal hot water systems for all proposed buildings, excluding existing Buildings 2, 12, and 21. At least 15 percent of the roof area would include roof-mounted or building-integrated PV systems and/or roof-mounted solar thermal hot water systems that would be installed in residential and commercial buildings. Solar PV systems transform sunlight into electricity and solar thermal water systems use the sun's energy to heat water for consumer use. These systems would partially offset the energy demands of the associated buildings. No ground-mounted facilities are proposed under the Proposed Project. The solar PV arrays located on various rooftops could be interconnected via a community microgrid that serves as a site-wide distribution network capable of balancing captive supply and demand resources to maintain stable service within the Project. Microgrids combine various distributed energy resources – such as whole-building energy efficiency improvements, solar photovoltaics, other clean generation such as fuel cells, battery storage, and localized smart energy management technologies – to form a whole system that is greater than its parts. The microgrid can be backed up by the local public utility grid and would not necessarily supply all of the demand from the Proposed Project.

PROPOSED GRADING AND STABILIZATION PLAN

SITE GRADING

The Proposed Project would involve excavation of soils for grading and construction of the 15- to 27-foot-deep basements planned on Parcels A, B, C1, C2, D, E1, E2, E3, E4, F, G, H1, H2, PKN, PKS, HDY1 and HDY2. No basement levels are planned for existing Buildings 2, 12, or 21. The Proposed Project would raise the grade of the 28-Acre Site and the southern, low-lying portions

[50] San Francisco Building Code, Chapter 13C.

[51] San Francisco Green Building, Environment Codes – Better Roof Requirements for Renewable Energy Standards, Ordinance No. 71-16, April 19, 2016.

of the Illinois Parcels by adding up to 5 feet of fill in order to help protect against flooding and projected future sea level rise, as described below, and as required for environmental remediation.

A portion of the northern spur of the remnant of Irish Hill would be removed for construction of the new 21st Street. The remnant of Irish Hill stands approximately 35 feet tall. Retaining walls would be necessary along the sides of the new 21st Street to protect the adjacent Building 116 in the Historic Core as well as the remnant of Irish Hill and along the reconfigured 22nd Street, to account for the proposed elevation difference between the streets and adjacent ground surfaces.[52]

While the grading plan assumes some on-site reuse of the excavation soil, which would be stockpiled and reused as fill throughout the project site, a substantial amount of soil export would be required. The Proposed Project would result in a net export total of about 340,000 cubic yards of soil and an import of about 20,000 cubic yards of clean fill, which would be phased over the duration of the planned construction activities.

BUILDING 12 GRADING OPTIONS

In order to provide flexibility for site grading work anticipated as part of the rehabilitation of Building 12, the Proposed Project includes three grading options for Building 12, described below. The determination of a final grading option will ultimately be decided prior to building permit issuance.

Grading Option 1: Raise the Exterior Grade Only

Under Grading Option 1, the structural frame of Building 12 would remain at the current grade. The grade differential of up to about 4 feet between the finished floor elevation of Building 12 and the surrounding street elevation would be bridged by stepped or sloped treatment of the area adjacent to the building, allowing the exterior wall to remain fully exposed. No changes to the interior floor elevation would occur under this option. All exterior, character-defining features of Building 12 would remain visible.

Grading Option 2: Raise the Interior Slab on Grade of Building 12 Structural Frame and Raise the Exterior Grade

Grading Option 2 would raise the interior slab up to a maximum of 3 feet, and raise the adjacent exterior an additional 4 feet, while leaving the Building 12 structure in place. A new slab on grade would be placed over compacted fill and a thickened edge of slab would be placed around the building perimeter. This alternative would cover some currently exposed steel column-to-foundation connections, shorten the height of pedestrian and vehicular openings, and lower the

[52] The areas on the 28-Acre Site and Illinois Parcels directly adjacent to the 20th Street Historic Core would conform to existing grades; fill would not be placed in these adjacent areas.

sill heights of ground-floor windows, as viewed from the interior. Except for the first 4 feet, the exterior walls of Building 12 would remain fully visible and unchanged from current conditions. To accommodate any remaining elevation change necessary to meet street elevations, the grade differential would be bridged by stepped or sloped treatments.

Grading Option 3: Raise Building 12 Structural Frame

Grading Option 3 would raise and place Building 12 on a new slab foundation at the new grade elevation. The surrounding grade would gradually slope away from the building as needed for drainage purposes. This option would entail disconnecting the structural steel columns from the foundations by unbolting the existing anchor bolts, then incrementally jacking up the building columns to the desired elevation. Due to sitewide grading, the building foundation would be exposed on the northern and eastern sides.

GEOTECHNICAL STABILIZATION

To address the potential hazard of liquefaction and lateral spreading that may occur during a major earthquake, the Proposed Project would include construction of improvements to control the amount of lateral displacement that could occur. These improvements could include either reinforcing the existing slope with structural walls or implementing ground improvements. The structural walls would consist of below-grade secant pile walls along the northeastern and southeastern portions of the project site (north and south of the Slipway structures), to contain and stabilize the soil. Secant pile walls are formed as a series of intersecting reinforced concrete piles, and could generally be constructed by installing a set of primary piles or concrete-filled drill holes, followed by an interlocking, secondary set of piles, with a concrete cap on top, which would be supported by micropile or tie-back anchors set at an angle. Ground improvements may consist of chemical treatments, such as deep soil mixing to add a cement slurry, or vibratory methods, such as vibro-compaction, vibro-replacement, and/or compaction, to strengthen the existing soil.

PROPOSED SHORELINE PROTECTION IMPROVEMENTS AND SEA LEVEL RISE ADAPTATION

The project sponsors' primary criteria for sea level rise adaptation include the following:[53]

- Reserve the 100-foot shoreline band for public access that is safe and feasible;
- Elevate all buildings and immovable facilities (e.g., roadways) such that adaptation would not be necessary for current worst-case end-of-century sea level rise estimates

[53] Moffat and Nichol, "Pier 70 Development, Preliminary Shoreline Improvements Report, San Francisco, California," Draft, August 2015, p. 16.

provided in the National Research Council's June 2012 *Sea-Level Rise for Coasts of California, Oregon and Washington;*[54] and

- Elevate the Bay Trail such that adaptation would not be necessary over the next 20 to 30 years (by mid-century).

Based on the above criteria, the Proposed Project would include the following improvement concepts:

- Finished floors of buildings within the project site would be elevated to a minimum elevation of 15.4 feet NAVD88 (+104 feet project datum [+4 feet SF Datum])[55,56,57] to accommodate 66 inches of sea level rise and the 100-year storm surge.
- The Bay Trail in the vicinity of the shoreline would be located at an elevation to accommodate 24 inches (2 feet) of sea level rise before adaptation may be necessary.
- The approximately 40-foot-wide zone between the Bay Trail and the water's edge would be designed to provide safe public access to the water in the near term. This zone would also function as the space where future adaptations could be creatively implemented based on the concepts of "Living with the Bay" and "Managed Retreat." Future adaptations in this area would allow for public access to retreat within the zone between the Bay Trail and shoreline. Adaptations could also include relocating and raising pathways and spur trails, or reconfiguring the shoreline protection to provide flatter slopes, wetlands and wave breaks.

These protection improvement concepts would allow for future adaptations along the shoreline to address higher levels of sea level rise with either the same or a different structural configuration. The Proposed Project would include a public financing mechanism to pay for the cost of future improvements related to sea level rise adaptation, should such improvements be necessary, with the City and the Port responsible for implementing these strategies.

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[54] The National Academies Press, *Sea-Level Rise for the Coasts of California, Oregon, and Washington*, dated 2012. Available online at http://www.nap.edu/read/13389/chapter/1. Accessed June 29, 2016.

[55] The Project Datum elevations are equal to San Francisco Datum elevations plus 100 feet.

[56] North American Vertical Datum of 1988 (NAVD88) is a fixed reference point (vertical elevation) adopted as the official, civilian, vertical datum for elevations determined by federal surveying. Historically, the average (mean) sea level or some variation of sea level has served as a reference point for elevations. One problem with using sea level is that it changes. In addition, the earth is not spherical, but has an ellipsoid shape, and has local variations due to uplift and sinking of portions of the earth's crust. Therefore, sea level in relation to the earth's crust varies. A vertical datum system not based on sea level avoids these problems. NAVD88 is based on a point in Quebec, Canada. Sources: U.S. Geologic Survey, http://water.usgs.gov/ADR_Defs_2005.pdf, pp. 8-9, accessed June 22, 2015.

[57] San Francisco City Datum establishes the City's zero point for surveying purposes at approximately 11.4 feet above the 1988 North American Vertical Datum. The project sponsors have also established a project datum for project-specific purposes that is equal to San Francisco City Datum plus 100 feet. This is 88.6 feet higher than NAVD88.

SHORELINE PROTECTION IMPROVEMENTS

The 28-Acre Site has about 1,380 feet of shoreline along its eastern edge. The objectives of the proposed shoreline protection improvements include maintaining a stable shoreline in the project area by preventing shoreline erosion and protecting the proposed development from coastal flooding. The proposed shoreline protection system is designed to minimize the need for placing fill in San Francisco Bay; maximize open space and public access to the shoreline edge; improve existing slope protection, where feasible; develop aesthetically pleasing and cost-efficient shoreline protection; and provide for future sea level rise adaptation. For design purposes, the existing shoreline is divided into four separate "reaches"[58] (see Figure 2.25: Shoreline Improvements Map):

- The Reach I shoreline consists of 480 feet along the northern portion of the project site. The top of the bank elevation is 12 to 13.5 feet NAVD88 (+100.6 to +102.1 feet Project Datum [+0.6 to +2.1 feet SF Datum]). This shoreline contains scattered rock and concrete debris (riprap) placed historically for shoreline protection and washed ashore by wind and waves. Portions of the shoreline have a concrete apron. Remnant piles from a former pier structure are scattered through the reach.
- Reach II is a 100-foot stretch of east-west shoreline that faces north and consists of a vertical bulkhead. The top of the bulkhead elevation is 12 to 11.8 feet NAVD88 (+100.6 to +100.4 feet Project Datum [+0.6 to +0.4 feet SF Datum]). Reach II forms the northern limit of the slipways. The vertical bulkhead is made up of steel sheet piles with an overhanging concrete cap.
- Along the southern portion of the project site, Reach III consists of the Slipways 5, 6, 7, and 8, which are bounded by craneways that are perpendicular to the shore. Reach III is 530 feet long. The top of bank elevation is 11.1 to 13 feet NAVD88 (+99.7 to +101.6 feet Project Datum [-0.3 to +1.6 feet SF Datum]). The craneways are constructed of concrete bulkhead walls with an overhanging concrete cap. Located between the craneways, the slipways have a concrete ramp that extends into San Francisco Bay. There is a sheet pile wall at the mudline where the craneways end. Along the existing top of bank, riprap has been placed on the slipways prevent scour. The inland portions of slipways have been filled and covered with asphalt.
- Reach IV encompasses 270 feet along the southern portion of the project shoreline. The top of bank elevation is 12 to 11.3 feet NAVD88 (+100.6 to +99.9 feet Project Datum [+0.6 to -0.1 feet SF Datum]). The Reach IV shoreline faces southeast and consists of riprap. The southern portion of Reach IV is covered by an armor stone revetment installed by PG&E as a remedial measure. This revetment consists of a layer of permeable reactive material on the previous shoreline surface, an overlying bedding layer of gravel, and an armor stone layer on the stabilized shoreline surface. There is an engineered retaining wall at the southern end of the project site, which protects the shoreline of the former Potrero Power Plant property.

[58] A reach is a continuous stretch of or extent of land.

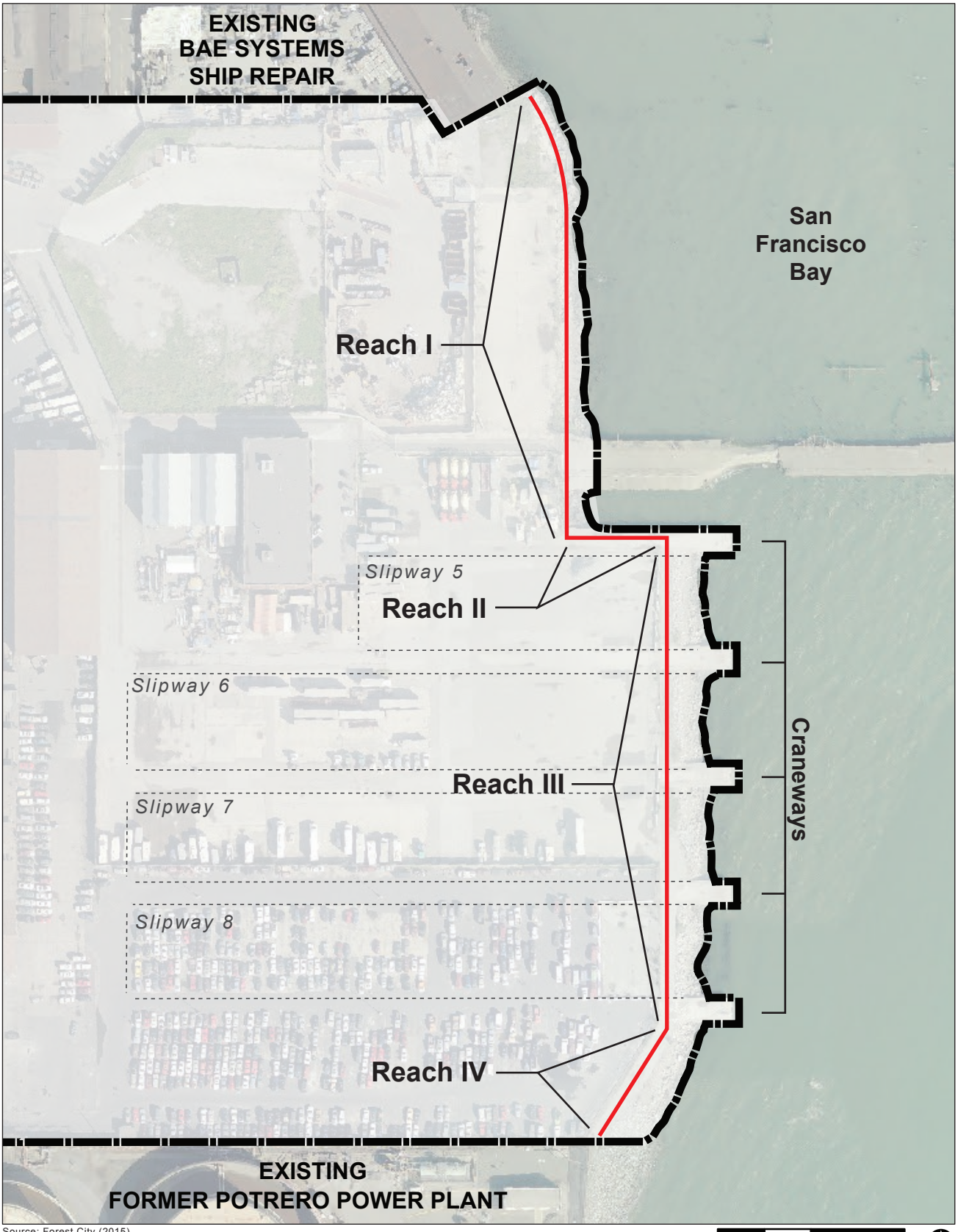

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FIGURE 2.25: SHORELINE IMPROVEMENTS MAP

Options for shoreline protection improvements were developed for each reach. The proposed shoreline protection improvements and sea level rise adaptation planning criteria are described below.

Reach I

Along Reach I, the existing rip-rap revetment above would be repaired by removing the rip-rap and placing new geotextile fabric and rip-rap materials. The repaired shoreline would have an approximately 3:1 slope. Construction of these repairs would require in-bay construction activities below the high tide level of 7.4 feet NAVD88 (96 feet project datum [-4 feet SF Datum]).

Above 11.4 feet NAVD88 (+100 feet elevation), the slope would include an engineered riprap revetment option or a flatter slope option.[59] The revetment option would consist of a rock slope protection system made up of armor stones, to protect the shoreline from erosion that would be underlain by geotextile fabric. A crushed-rock leveling course (i.e., top) would also be emplaced. The flatter slope option would consist of erosion-resistant materials (e.g., vegetation).[60] At this elevation there would also be an approximately 6-foot-wide informal pathway to provide pedestrian access to the shoreline until such time as it becomes infeasible.

Reach II

Along Reach II, the existing bulkhead would be studied and either repaired or replaced. The repair or replacement would be constructed on the water side of the existing bulkhead wall, located in San Francisco Bay shoreline. Since repair and replacement would require excavation and fill, below the high tide level of 7.4 feet NAVD88 (96 feet project datum [-4 feet SF Datum]), two options are being considered: a sheet pile wall or a soldier pile wall.

- Sheet Pile Wall Option: Under the sheet pile wall option, interlocking steel sheet piles would be installed. These can be driven below the water surface without the need of temporary cofferdams or dewatering. Individual sheets would be Z-shaped or U-shaped with a ball and socket type of interlock. Once the sheet piles are installed, a concrete (or steel) cap would be constructed to distribute the loads and to provide a finished look to the wall.
- Soldier Pile Wall Option: The soldier pile wall option consists of individual piles spaced a short distance apart, with gaps between the piles filled with lagging. The piles would be cast-in-drilled-hole piles, which are built by drilling a hole and inserting a reinforcing cage, then filling the hole with concrete. Installing a soldier pile wall may require temporary cofferdams or dewatering.

[59] A revetment is a retaining wall or facing of masonry or other material, supporting or protecting a rampart or wall.

[60] Armor stones are the outer layer of any rock slope protection. The rocks can be of any size.

Reach III

Proposed shoreline protection improvements for Reach III include repairing the existing slope protection with armor stone and a crushed-rock leveling course. Construction of these repairs would require in-water construction activities below the high tide level of 7.4 feet NAVD88 (96 feet project datum).

For the 11.4 to 15.4 feet NAVD88 (+100 to +104 feet Project Datum [+0 to +4 feet SF Datum]) elevation areas, several options are possible, including a riprap revetment, hardscape steps, or a cantilevered/pile-supported deck.[61] The riprap revetment option would include armor stone and a crushed-rock leveling course. The hardscape steps option would consist of wide concrete steps that could also be used for sitting and walking. The cantilevered/pile-supported deck would extend over the sloping shoreline for a short distance between craneway structures, and would allow visitors to be closer to the water and could offer a space for public art. At this elevation there would also be an approximately 6-foot-wide informal pathway to provide pedestrian access to the shoreline until such time as it becomes infeasible.

Reach IV

The proposed shoreline protection improvements along Reach IV would include improvements and repairs to the existing revetment to create a smooth sloped revetment. Construction of these improvements would require in-water construction activities below the high tide level of 7.4 feet NAVD88 (96 feet project datum). Above 11.4 NAVD88 (+100 feet Project Datum [+0 feet SF Datum]). Above 11.4 feet NAVD88 (+100 feet Project Datum [+0 feet SF Datum]) elevation, the slope would include an engineered riprap revetment option or flatter slopes option with erosion-resistant materials (e.g., vegetation).[62] At this elevation, there would also be an approximately 6-foot-wide informal pathway to provide pedestrian access to the shoreline until such time as it becomes infeasible.

E. PROJECT VARIANTS

In addition to the specific characteristics of the Proposed Project described in this chapter, there are four proposed variants to the Proposed Project, each of which modifies one limited feature or aspect of the Proposed Project. One, a Reduced Off-Haul Variant, is a construction-related variant; the other three – a District Energy System Variant, a Wastewater Treatment and Reuse System (WTRS) Variant, and an Automated Waste Collection System (AWCS) Variant – are variants on infrastructure features of the Proposed Project, and all of the proposed variants focus on sustainability. The four variants are described below.

[61] These elevations are above the reach of present-day tides.
[62] This elevation is above the reach of present-day tides.

These variants to the Proposed Project are fully analyzed in Chapter 6, Project Variants, at a sufficient level of detail so that one or more of them would be available for selection by the decision-makers and the project sponsors as part of the project approval actions.

REDUCED OFF-HAUL VARIANT

The Reduced Off-Haul Variant would minimize the overall volume of excavated soils and the number of off-haul truck trips required for the transport and disposal of excavated soils. The strategy for achieving a reduction in the volume of excavated soils and the resultant off-haul truck trips is three-fold: (1) modify the preliminary grading plan developed for the Proposed Project to raise the base elevation for a portion of the 28-Acre Site; (2) eliminate the proposed 15-foot-deep below-grade basement levels at selected locations on the 28-Acre Site and extend the footprint of one proposed 15-foot-deep below-grade basement level; and (3) eliminate a portion of one of the two level below-grade basement levels. The combination of the proposed increase to the base elevation on a portion of the 28-Acre Site and the modifications to the below-grade basement level parking program would result in an approximately 56 percent reduction in the volume of excavated soils that would need to be transported off site (from approximately 340,000 cubic yards under the Proposed Project to approximately 150,000 cubic yards under this variant). As with the Proposed Project, under the Reduced Off-Haul Variant clean fill would need to be imported to the project site to help protect against flooding and projected future sea level rise. Under the Reduced Off-Haul Variant there would be a slight increase in the volume of clean fill that would need to be imported (from approximately 20,000 cubic yards under the Proposed Project to approximately 21,150 cubic yards). Overall, the Reduced Off-Haul Variant would result in an approximately 52 percent reduction in the combined earth movement.

DISTRICT ENERGY SYSTEM VARIANT

The Proposed Project assumes all heating and cooling would be done at the individual building level and independent from adjacent buildings. PG&E would provide natural gas, and electricity would be provided by the SFPUC and renewable power generated on the project site (e.g., roof-mounted or building-integrated solar photovoltaic systems and/or roof-mounted solar thermal hot water systems for all proposed buildings, if implemented).

Under the District Energy System Variant, a single central energy plant would be located in one of the basement levels of a newly constructed building on Parcel C1. The central energy plant would have a footprint of approximately 8,000 to 14,000 square feet, depending on the equipment used. Exhaust ducts would be required on the roof or façade of the building on Parcel C1. Fifteen- to twenty-foot-tall cooling towers would be located on the roof or would be adjacent to the building. The proposed central energy plant would provide heating and cooling for a linked

group of residential and commercial buildings. Hot water would be used for space heating and water heating, and chilled water would be used for space cooling.

Under this variant, building space heating and space cooling systems within the project site would be linked together via an underground shared energy distribution and exchange loop. The central energy plant would circulate the loop water to individual buildings via the shared energy distribution and exchange loop system that would be located under the proposed street and sidewalk network alongside other utilities. Each building would have heat pumps and a point-of-connection to the shared energy distribution and exchange loop system. Buildings that require heat would remove heat from the loop. Buildings that require cooling would reject that heat by pumping heated water into the loop, therefore removing it from each building's system. The peak water flow capacity of the closed loop system would be approximately 9,000 gallons per minute. The desired temperature range of the water in the loop system would be 50°F to 90°F. To maintain the water in the shared energy distribution and exchange loop system within the desired temperature range, the central energy plant would use natural-gas fired boilers to increase heat and cooling towers to reject heat. The central energy plant would also contain heat exchangers, pumps, boilers, and other ancillary equipment, and would obviate the need for a mechanical cooling tower located on the roof of each building.

WASTEWATER TREATMENT AND REUSE SYSTEM VARIANT

City Ordinance No. 109-15 (the Non-potable Water Ordinance) requires the use of on-site "alternate water sources" of treated blackwater, greywater, and rainwater water for toilet and urinal flushing and for irrigation demand for projects that require a subdivisions approval. Blackwater means wastewater contaminated by feces, urine, other bodily wastes, or other biological wastes, and includes wastewater from toilets, urinals, dishwashers, kitchen sinks, and utility sinks. Graywater is wastewater that has not been contaminated by any toilet discharge and has not been affected by infectious, contaminated, or unhealthy bodily wastes, including from processing, manufacturing, or operating wastes. Examples of graywater are wastewater from bathtubs, showers, bathroom sinks, and clothes washing machines, but not from toilets, kitchen sinks and dishwashers. Foundation drainage water is nuisance groundwater that is extracted to maintain the structural integrity of a building or facility and that would otherwise be discharged to the City's combined sewer system.[63]

Under the WTRS Variant, blackwater, graywater, and rainwater would be collected from all newly constructed buildings, treated, and reused for toilet and urinal flushing, irrigation, and

[63] City and County of San Francisco Ordinance 109-15, "Health, Public Works Codes - Mandatory Use of Alternate Water Supplies in New Construction" (June 15, 2016), amending San Francisco Health Code section 12C.2.

cooling tower makeup. The variant is different from the Proposed Project, because it assumes blackwater is treated and recycled and that all newly constructed buildings would form a district system.

The WTRS Variant consists of a single modular tertiary wastewater treatment system, along with associated collection and distribution piping. This modular system is in essence a miniature version of a typical advanced wastewater treatment plant, including primary treatment (settling and skimming to remove solids), secondary treatment (biological breakdown of organic materials), and advanced treatment (various methods of eliminating pathogens and certain other pollutants).

Under the variant there would be one WTRS module located on the BAE Systems Ship Repair site north of Parcels A and B. The WTRS module would have a footprint of approximately 10,000 to 20,000 square feet and would be fully enclosed within Building 108 (after seismic and structural upgrades to the existing building are completed) or in a newly constructed building on the adjacent asphalt parking lot. Installation of the WTRS module would occur in Phase 1. The piping system that would collect blackwater, graywater, and rainwater from the project site and send out treated wastewater for reuse would have backflow protection and meet other requirements toward the goal of preventing the contamination of potable water piping. This system would also have a cross-connection to the City's combined sewer system to discharge wastewater flows in excess of non-potable demand and in case of emergency.

The WTRS module would be sized to treat approximately 150,000 gallons per day (gpd) depending on the associated non-potable demands for the phase and location. The non-potable (or reuse) demand means the volume of treated wastewater needed for toilet and urinal flushing, irrigation, and cooling towers. Estimated water reuse demand for the Maximum Residential Scenario would be 126,150 gpd.[64] For the Maximum Commercial Scenario, this demand would be 150,500 gpd. Actual water reuse quantities would be determined in part by San Francisco Health Code Section 12.C.4, regarding Water Budget Documentation and related requirements. Wastewater flow in excess of the non-potable demand would be discharged into the City's combined sewer.

The WTRS module would include at least the following components or functions: feed tank (wastewater input); trash trap; bioreactor; disinfection and storage tank; and heat recovery. Chemicals required for the treatment process would include sodium hydroxide, citric acid (if membranes are used), and an oxidizing disinfection agent, such as sodium hypochlorite. Truck delivery of chemicals for each module would be once every two to six weeks per module.

[64] BKF, Memorandum to Forest City, re: "Pier 70 – Water Demand Memorandum," April 28, 2016, p. 4 and Tables 3 and 4 on pp. 7-8.

Excess liquid waste from the WTRS module would be discharged into the municipal sewer or hauled away by truck. If allowed by law and by the City, trash trap waste would be double-bagged and disposed of at a landfill.

Odor control units would be installed. The exhaust gases likely would be vented at the top of the building where the module would be located.

The following agencies would oversee the implementation the WTRS Variant at the project site: the SFPUC, the San Francisco Department of Building Inspection, the Port of San Francisco, and the San Francisco Department of Public Health. Collected wastewater would be treated to meet the water quality criteria as set forth by the California Code of Regulations, Title 22, Division 4, Chapter 3.

AUTOMATED WASTE COLLECTION SYSTEM VARIANT

Under the Proposed Project, typical collection trucks would drive around the project site to pick up solid waste (separated by residents and businesses into recyclables, compostables, and trash/waste) from each individual building for transport to Pier 96 (recyclables) in San Francisco, the Jepson-Prairie facility (compostables) in Solano County, and the Hay Road Landfill (trash/waste) in Solano County. An automated waste collection system is under consideration, because it has the potential to operate more efficiently and would reduce the number of trash collection truck trips and the associated noise and air pollutant emissions.

Under the AWCS Variant, an automated waste collection system would be installed to transport solid waste from individual new buildings and in public areas, replacing interior and outdoor trash receptacles. Occupants would be expected to properly disaggregate solid waste into the categories of recyclables, compostables, and trash, and deposit these waste streams into designated receptacles. The waste streams would be temporarily stored at the loading point of each building and then the pneumatic or vacuum system would transport the solid waste with an air suction stream (typically up to 60 miles per hour) through subsurface pipes to a central waste collection facility. Sensors in the temporary solid waste storage locations would initiate the vacuum sequence when the collected solid waste reaches the capacity of the temporary storage space. Alternatively, the vacuum sequence could be initiated according to a pre-determined schedule. Each collected waste stream would be compacted at the central waste collection facility before being hauled to an off-site processing facility.

The central waste collection facility would be located in a stand-alone building near the proposed 20th Street Pump Station on the BAE Systems Ship Repair site directly north of Parcels A and B on the project site. The footprint of the central waste collection facility would be approximately 5,000 square feet and would be housed within a two-story structure (approximately 35 feet in

height), for a total of 10,000 square feet. The central waste collection facility would house the suction equipment fans, air compressors, air filters, waste separators, compactors, containers for temporary storage, and other miscellaneous equipment. Full containers would be collected at a staging area within the AWCS facility and loaded onto trucks for off-site hauling. There would be an average of one truck per day.

Air filters (possibly including wet scrubbers) would be designed and operated to remove airborne particulates. To address odors from decomposing organic matter, the collection system pipes would be under negative pressure (i.e., vacuum towards the central waste collection facility). The AWCS facility would have activated carbon filters to reduce odors in the air flow and exhaust. Noise from fans, other equipment, and trucks would be reduced by using acoustical treatments on walls and ceilings, silencers, and other methods on the exhaust pipe, to reduce noise to 85 decibels or less, measured at the device. The project sponsors would install noise shielding to achieve the compliance standards of the San Francisco Noise Ordinance.

F. PROJECT CONSTRUCTION PHASING AND DURATION

For both development scenarios, the Maximum Residential Scenario and the Maximum Commercial Scenario, Proposed Project construction is conceptual; however it is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve up to five phases, designated as Phases 1, 2, 3, 4, and 5. Phasing estimates for the Maximum Residential Scenario are shown in Table 2.5: Project Construction and Rehabilitation Phasing for the Maximum Residential Scenario, and Figure 2.26: Proposed Phasing Plan – Maximum Residential Scenario. Phasing estimates for the Maximum Commercial Scenario are shown in Table 2.6: Project Construction and Rehabilitation Phasing for the Maximum Commercial Scenario, and Figure 2.27: Proposed Phasing Plan – Maximum Commercial Scenario. These phases are subject to change, but would occur within the maximum development ranges presented in the two scenarios.

Infrastructure improvements (utilities, streets, and open space) and grading and excavation activities would be constructed by Forest City, as master developer, and would occur in tandem, as respective and adjacent parcels are developed. Vertical development on the various parcels could be constructed by Forest City and its affiliates, or by third party developers.

Table 2.5: Project Construction and Rehabilitation Phasing for the Maximum Residential Scenario

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (gsf / No. of Residential Units)	Commercial (gsf)	RALI (gsf)		
Phase 1 (2018-2019)	*28-Acre Site*						
	Illinois Parcels	PKN	261,700 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new) 20th Street Pump Station (new)
Phase 2 (2018-2020)	*28-Acre Site*	Building 2*, Parcel C1, Parcel C2, Parcel D, Parcel E2	578,250 / 662 units	221,100	52,035	Building 12 Market Plaza Market Square Slipways Commons (western portion)	20th Street (new/central portion) 21st Street (new/eastern portion) 22nd Street (existing and new) Louisiana Street (new/southern portion) Maryland Street (new/northern portion)
		Building 12*		60,000	105,500		
	Illinois Parcels						
Phase 3 (2021-2023)	*28-Acre Site*	Parcel A, Parcel F, Parcel G	436,100 / 505 units	288,200	57,270	Irish Hill Playground	Maryland Street (new/southern portion [continued from Phase 2]), and Louisiana Street (new/northern portion) [continued from Phase 2)
	Illinois Parcels	PKS	213,100 / 240 units		11,000		

Table 2.5 Continued

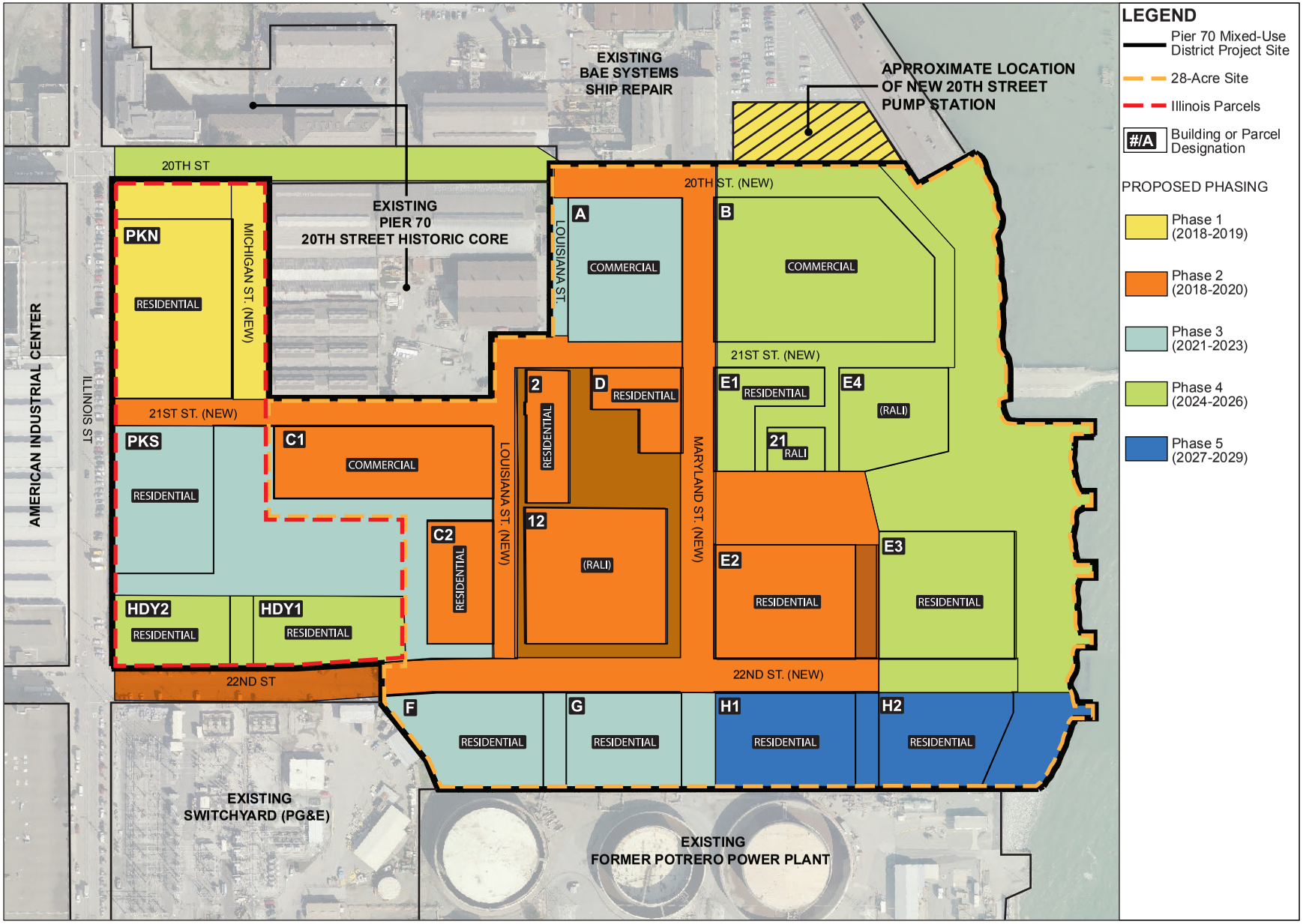
Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (gsf / No. of Residential Units)	Commercial (gsf)	RALI (gsf)		
Phase 4 (2024-2026)	*28-Acre Site*	Parcel B, Parcel E1, Parcel E3, Parcel E4	378,600 / 436 units	526,350	189,675	Slipways Commons (eastern portion [continued from Phase 3])	20th Street (western and eastern portions [continued from Phase 2])
		Building 21*			10,200	Waterfront Terrace Waterfront Promenade (northern portion)	21st Street (eastern portion [continued from Phase 2]) 22nd Street (eastern portion [continued from Phase 2])
	Illinois Parcels	Parcel HDY1, Parcel HDY2	285,200 / 335 units		17,200		
Phase 5 (2027-2029)	*28-Acre Site*	Parcel H1, Parcel H2	477,050 / 547 units		40,700	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
TOTAL			**2,630,000 / 3,025 units**	**1,102,250**	**479,980**		

Notes:

Phases shown are subject to change, but would occur within the maximum development ranges presented in the two scenarios.

* = denotes an existing building that would be rehabilitated under the Proposed Project.

Source: Forest City; Turnstone/SWCA



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.26: PROPOSED PHASING PLAN - MAXIMUM RESIDENTIAL SCENARIO

Table 2.6: Project Construction and Rehabilitation Phasing for the Maximum Commercial Scenario

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (gsf / No. of Residential Units)	Commercial (gsf)	RALI (gsf)		
Phase 1 (2018-2019)	*28-Acre Site*						
	Illinois Parcels	PKN	260,500 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new) 20th Street Pump Station (new)
Phase 2 (2018-2020)	*28-Acre Site*	Parcel A, Parcel D, Parcel E2, Building 2*	389,400 / 445 units	348,200	97,400	Building 12 Market Plaza Market Square Slipways Commons (western portion)	20th Street (new/central portion) 22nd Street (existing and new) Maryland Street (new/northern portions)
		Building 12*			52,720		
	Illinois Parcels	PKS	215,500 / 245 units		11,000		
Phase 3 (2021-2023)	*28-Acre Site*	Parcel C2, Parcel E1, Parcel F, Parcel G	325,350 / 375 units	442,200	57,620	Irish Hill Playground	21st Street (new/eastern portion) Louisiana Street (new) Maryland Street (new/southern portion [continued from Phase 2])
	Illinois Parcels	Parcel HDY1, Parcel HDY2		231,700	28,135		

Table 2.6 Continued

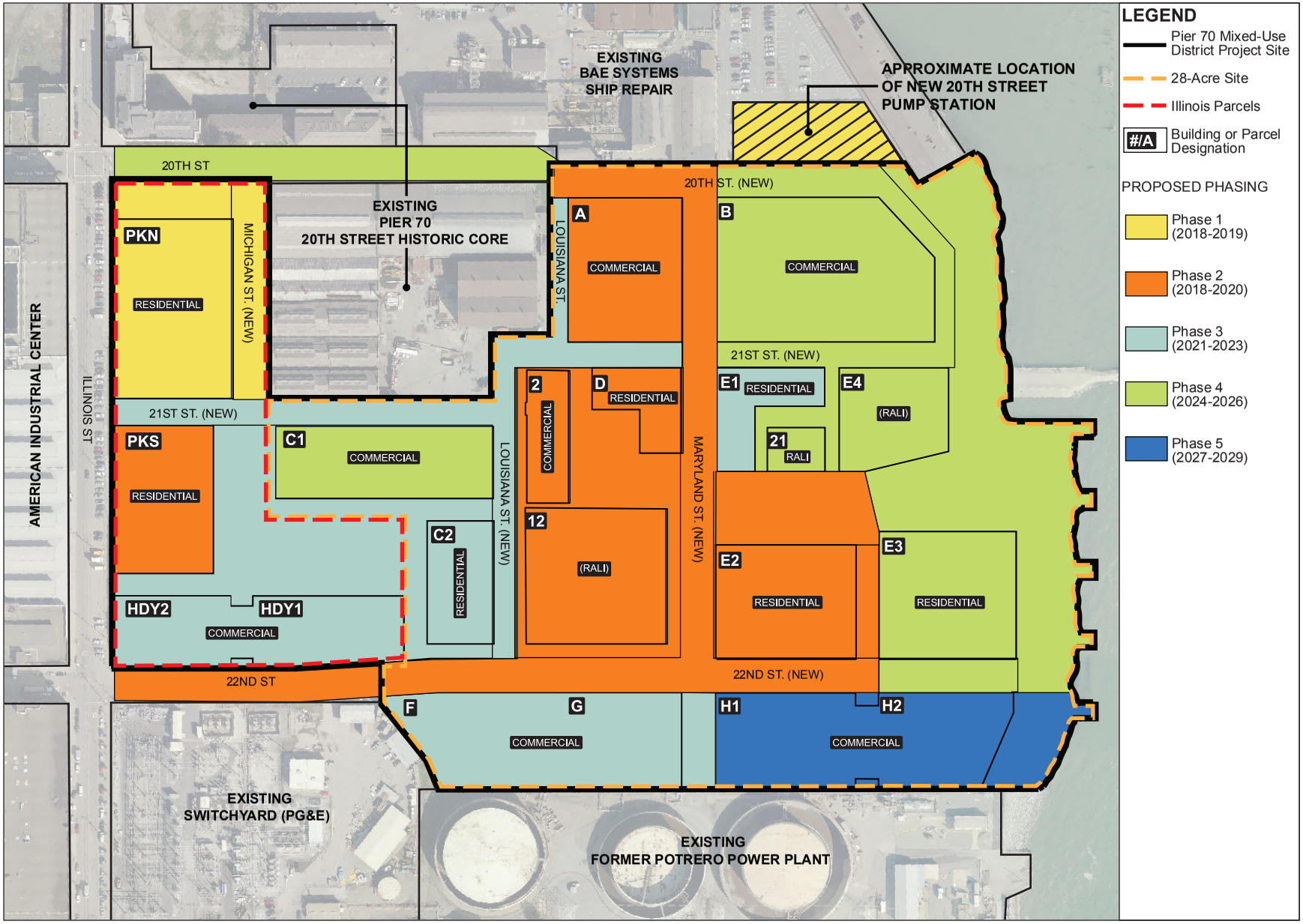
Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (gsf / No. of Residential Units)	Commercial (gsf)	RALI (gsf)		
Phase 4 (2024-2026)	*28-Acre Site*	Parcel B, Parcel C1, Parcel E3,	242,250 / 280 units	747,450	85,505	Slipways Commons (eastern portion [continued from Phase 2]) Waterfront Terrace Waterfront Promenade (northern portion)	20th Street (western and eastern portions [continued from Phase 2]) 21st Street (western portion [continued from Phase 3]) 22nd Street (eastern portion [continued from Phase 2])
		Building 21*, Parcel E4			110,400		
	Illinois Parcels						
Phase 5 (2027-2029)	*28-Acre Site*	Parcel H1, Parcel H2		486,200	37,570	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
Total			**1,433,000 / 1,645 units**	**2,262,350**	**486,950**		

Notes:

Phases shown are subject to change, but would occur within the maximum development ranges presented in the two scenarios.

* = denotes an existing building that would be rehabilitated under the Proposed Project.

Source: Forest City; Turnstone/SWCA



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 2.27: PROPOSED PHASING PLAN - MAXIMUM COMMERCIAL SCENARIO

G. PROJECT APPROVALS

The Proposed Project is subject to review and approvals by local, regional, State, and Federal agencies, with jurisdiction after completion of environmental review, including the following:

San Francisco Board of Supervisors

- Approval of *General Plan* amendments.
- Approval of Planning Code Amendments and associated Zoning Map Amendments.
- Approval of a Development Agreement.
- Approval of the Interagency Cooperation Agreement.
- Approval of a Public Trust Exchange Agreement.
- Approval of a Disposition and Development Agreement, including forms of ground leases and purchase and sale agreements.
- Approval of Final Subdivision Maps.
- Approval of street vacations, approval of dedications and easements for public improvements, and acceptance (or delegation to Public Works Director to accept) of public improvements, as necessary.
- Approval of the formation of one or more community facilities districts and adoption of a Rate and Method of Apportionment for the districts and authorizing other implementing actions and documents.
- Approval of one or more appendices to the Infrastructure Financing Plan for City and County of San Francisco Infrastructure Financing District No. 2 (Port of San Francisco) and formation of one or more sub-project areas for the 28-Acre Site and some or all of the Illinois Parcels and authorizing other implementing actions and documents.

San Francisco Planning Commission

- Certification of the Final EIR.
- Adoption of findings that the Public Trust Exchange is consistent with the *General Plan*.
- Approval of Proposition M Office Allocation per Planning Code Section 321, to the extent applicable.
- Approval of Pier 70 SUD Design for Development.
- Initiation and recommendation to Board of Supervisors to approve amendments to the *General Plan*.
- Initiation and recommendation to the Board of Supervisors to approve Planning Code amendments adopting a Special Use District and associated Zoning Map amendments.
- Recommendation to Board of Supervisors to approve a Development Agreement.
- Approval of the Interagency Cooperation Agreement.

San Francisco Port Commission

- Adoption of findings regarding Public Trust consistency.
- Approval of Disposition and Development Agreement, including forms of Ground Leases and Purchase and Sale Agreements, authorizing other actions and documents necessary to implement the project, and recommending that the Port Commission and the Board of Supervisors take other actions and documents necessary to implement the project.
- Consent to a Development Agreement and recommendation to the Board of Supervisors to approve.
- Approval of the Interagency Cooperation Agreement.
- Approval of a Development Plan for the 28-Acre Site in accordance with Section 11 of Proposition F.
- Approval of *Pier 70 SUD Design for Development*.
- Approval of amendments to *Waterfront Land Use Plan*.
- Public Trust consistency findings and approval of Public Trust Exchange Agreement with the State Lands Commission.
- Approval of project construction-related permits for property within Port jurisdiction.
- Approval of Construction Site Stormwater Runoff Control Permit.

San Francisco Public Utilities Commission

- Consent to Development Agreement.
- Consent to Interagency Cooperation Agreement.

San Francisco Public Works

- Review of subdivision maps and presentation to the Board for approval.
- Approval of Interagency Cooperation Agreement.
- Issuance of Public Works street vacation order.

San Francisco Municipal Transportation Agency

- Approval of transit improvements, public improvements and infrastructure, including certain roadway improvements, bicycle infrastructure and loading zones, to the extent included in the project, if any.
- Consent to Development Agreement.
- Consent to Interagency Cooperation Agreement.

San Francisco Fire Department

- Consent to Interagency Cooperation Agreement.

San Francisco Art Commission

- Approval of design of public structures and private structures located within public property, to the extent any such structures are located outside of Port jurisdiction.

San Francisco Department of Public Health

- Oversee compliance with San Francisco Health Code Article 22A (Maher Ordinance).

Bay Conservation and Development Commission

- Approval of permits for improvements and activities within the San Francisco Bay Conservation and Development Commission's jurisdictions.

State Lands Commission

- Approval of Public Trust Exchange Agreement.

Regional Water Quality Control Board – San Francisco Bay Region

- Approval of Section 401 water quality certification.
- Site-Specific Remediation Completion Approval(s) under Risk Management Plan.

Bay Area Air Quality Management District

- Approval of any necessary air quality permits (e.g., Authority to Construct and Permit to Operate) for individual air pollution sources, such as boilers and emergency diesel generators.

California Public Utilities Commission

- Approval of PG&E's sale of Hoedown Yard parcel, if PG&E's operations on the site have not already been relocated.

California Department of Fish and Wildlife

- Possible Section 404/Section 10 Permit.

U.S. Army Corps of Engineers

- Possible Section 404/Section 10 Permit.

U.S. Fish and Wildlife

- Possible Section 404/Section 10 Permit.

National Marine Fisheries Service

- Possible Essential Fish Habitat Consultation.
- Possible Endangered Species Act Consultation.

3. PLANS AND POLICIES

In accordance with CEQA Guidelines Section 15125(d), Chapter 3, Plans and Policies, discusses inconsistencies between the Proposed Project and applicable local, regional, and State plans and policies. Inconsistencies with existing policy do not, in and of themselves, indicate a significant physical environmental effect within the meaning of CEQA. To the extent that adverse physical environmental impacts may result from such inconsistencies, these impacts are analyzed in this EIR in the specific topic sections in Chapter 4, Environmental Setting and Impacts. The staff reports and approval motions prepared for the decision-makers as part of the entitlements approval process will include a comprehensive project analysis and findings regarding the consistency of the Proposed Project with applicable plans, policies, and regulations independent of the environmental review process.

A. LOCAL PLANS AND POLICIES

San Francisco General Plan

The *San Francisco General Plan* (*General Plan*) is the embodiment of the City's vision for the future of San Francisco.[1] It provides general policies and objectives to guide land use decisions and contains some policies that relate to physical environmental issues. The *General Plan* comprises a series of ten elements, each of which pertains to a particular topic that applies Citywide: Air Quality, Arts, Commerce and Industry, Community Facilities, Community Safety, Environmental Protection, Housing, Recreation and Open Space, Transportation, and Urban Design. The *General Plan* also includes area plans, each of which focuses on a particular area of the City. The project site is within the geographic area covered by the *Central Waterfront Area Plan*, discussed on p. 3.2.

The Planning Department, the Zoning Administrator, the Planning Commission, the Board of Supervisors, and other City decision-makers will evaluate the Proposed Project for conformance with the objectives and policies of the *General Plan*, and will consider potential inconsistencies as part of the decision-making process. The consideration of *General Plan* objectives and policies is carried out independent of the environmental review process, as part of the decision to approve, modify, or disapprove a proposed project.

Potential conflicts with the *General Plan* Urban Design Element will be considered by the decision-makers as part of actions to approve, modify, or disapprove the Proposed Project. As discussed on pp. 1.2-1.3, Public Resources Code Section 21099 eliminates the analysis of

[1] San Francisco Planning Department website. Available online at http://www.sf-planning.org/ftp/General_Plan/index.htm. Accessed December 8, 2015.

aesthetics in the environmental review for this Proposed Project under CEQA. The topic of aesthetics may no longer be considered in determining the physical environmental effects of the Proposed Project under CEQA. Therefore, insofar as impacts resulting from the Proposed Project's conflict with the *General Plan* Urban Design Element are premised on underlying aesthetic concerns (such as impacts on visual and scenic resources, public views, urban design, and visual character and quality), such conflicts are not considered significant impacts for the purposes of CEQA under Public Resources Code Section 21099.

CENTRAL WATERFRONT AREA PLAN

The *Central Waterfront Area Plan* is one of the four plan areas covered by the *Eastern Neighborhoods Rezoning and Area Plan*, which was adopted in 2008. The Eastern Neighborhoods encompass much of the City's industrial zoned land and have been transitioning to other uses over the past several decades. One of the goals of the Eastern Neighborhoods planning effort was to find a balance between growth of housing and office uses and preservation of production, distribution, and repair (PDR) facilities. The *Central Waterfront Area Plan* acknowledges recent changes in the land use character in the vicinity of the project site within the northern portion of the *Central Waterfront Area Plan*.

> Portions of the Central Waterfront have been transitioning from PDR to a more mixed-use character. This has been particularly the case in the northern portion of the neighborhood, with new residential development and a small amount of new retail occurring along Third Street. In addition, life science and medical related uses are expected to desire locations close to Mission Bay in the northern portion of this neighborhood. This mix of uses in the northern portion of the neighborhood should be maintained and promoted, while the core PDR areas south of 23rd Street and east of Third Street should be protected.[2]

Although the project site is included in the geographic area covered by the *Central Waterfront Area Plan*, that plan did not revise zoning and height controls for the majority of the Pier 70 area; only heights for the western end of the project site, west of the Michigan Street alignment, were revised,[3] deferring to the Port's Pier 70 area planning process, which was ongoing when the *Central Waterfront Area Plan* was being prepared.[4] (See the discussion of the Port's *Pier 70 Preferred Master Plan* on pp. 3.7-3.9.) As described on pp. 3.3-3.4, implementation of the Proposed Project would require amendment of the existing Use Districts and Height and Bulk Districts within the project site.

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[2] City and County of San Francisco, *Central Waterfront Area Plan*, December 2008, p. 7.

[3] The Height District for the area covered by the Illinois Parcels PKN, PKS, and HDY2 was changed from 40-X to 65-X.

[4] City and County of San Francisco, *Central Waterfront Area Plan*, December 2008, p. 8. "Because the Port's Pier 70 planning process for Pier 70 is ongoing, this Plan leaves zoning and height controls for the area as-is, in recognition that the Plan may need to be amended, and zoning modified, to reflect the outcome of the Port's Pier 70 area planning process."

San Francisco Planning Code

The San Francisco Planning Code, which incorporates by reference the City's Zoning Maps, implements the *General Plan* and governs permitted uses, density, and configuration of buildings within the City. Permits to construct new buildings (or to alter or demolish existing ones) may not be issued unless (1) a project complies with the Planning Code, (2) allowable exceptions are granted pursuant to provisions of the Planning Code, or (3) amendments to the Planning Code are included as part of the Proposed Project.

The Zoning Map consists of a series of numbered maps that divide the City into geographic sections and show the locations and boundaries of zoning districts (Maps ZN01 through ZN14) and Height and Bulk Districts (Maps HT01 through HT14). Use Districts are the base zoning that prescribes which land uses are permitted and most development standards (except height and bulk). Height and Bulk Districts are mapped separately from the Use Districts and prescribe the maximum height and bulk of buildings.

USE DISTRICTS

As shown on Figure 4.B.1: Existing Use Districts in the Project Vicinity, in Section 4.B, Land Use and Land Use Planning, p. 4.B.3, the project site is zoned P (Public) in the eastern portion of the Hoedown Yard within the Illinois Parcels, and the rest of the project site is zoned M-2 (Heavy Industrial). Some of the proposed land uses within the project site (residential, commercial, and retail/arts/light-industrial [RALI][5]) are inconsistent with these existing zoning designations.

Implementation of the Proposed Project would therefore require an amendment to the Planning Code that would create a new Pier 70 Special Use District (SUD) to establish land use zoning controls for the project site. The proposed SUD would also incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development* document.[6] The Zoning Maps would be amended to show changes from the current zoning P (Public) and M-2 (Heavy Industrial) districts to the proposed SUD zoning.

HEIGHT AND BULK DISTRICTS

As shown on Figure 4.B.2, Existing Height and Bulk Districts in the Project Vicinity, in Section 4.B, Land Use and Land Use Planning, p. 4.B.4, the Illinois Parcels, on the westernmost portion of the project site, are currently within a 65-X Height and Bulk District. The remainder

[5] The proposed project would include market-rate and affordable residential uses, commercial use, retail, restaurant, and arts/light industrial (which are collectively referred to for the purposes of this EIR as RALI uses).

[6] The proposed *Pier 70 SUD Design for Development* document, which is included as part of the Proposed Project, would set forth the underlying vision and principles for development of the project site, and establishes standards and design guidelines to implement them.

of the project site (encompassing the 28-Acre Site and the eastern portion of the Hoedown Yard within the Illinois Parcels) is currently within a 40-X Height and Bulk District. Bulk controls (i.e., limits on horizontal building dimensions) do not apply within an "X" Bulk District.

On November 4, 2014, the San Francisco electorate approved Proposition F, a ballot measure that authorized a height increase at the 28-Acre Site from the existing 40 feet to 90 feet, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet. Proposition F conditioned the proposed height increase on completion of an EIR and approval of a development plan for the 28-Acre Site by the Port Commission and the Board of Supervisors. Proposition F did not apply to the Illinois Parcels; the area along Illinois Street had already been rezoned from 40-X to 65-X Height and Bulk District under the *Central Waterfront Plan*.

Building heights under the Proposed Project are inconsistent with the existing height limits on the project site. Upon certification of this EIR and the approval of a development plan for the 28-Acre Site by the Port Commission and Board of Supervisors, the legislative amendment to the existing Planning Code height and bulk limits within the project site adopted under Proposition F would become effective, and the existing 40-X Height and Bulk District within the inland portions of the 28-Acre Site would become 90-X, a height limit increase of 50 feet (the existing height and bulk designation along a 100-foot-wide area along the shoreline would remain at 40-X). (See Figure 2.13: Proposed Height Limits Plan, in Chapter 2, Project Description, p. 2.40.) The existing 40-X Height and Bulk District of the eastern portion of the Hoedown Yard within the Illinois Parcels would be changed from 40-X to 65-X, a height limit increase of 25 feet. The existing 65-X height and bulk designation within the rest of the Illinois Parcels would remain at 65-X.

The Accountable Planning Initiative

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added Section 101.1 to the Planning Code and established eight Priority Policies. These policies are (1) preservation and enhancement of neighborhood-serving retail uses and future opportunities for resident employment in and ownership of such businesses; (2) conservation and protection of existing housing and neighborhood character to preserve the cultural and economic diversity of neighborhoods; (3) preservation and enhancement of affordable housing; (4) discouragement of commuter automobiles that impede Muni transit service or that overburden streets or neighborhood parking; (5) protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership; (6) maximization of earthquake preparedness; (7) preservation of landmarks and historic buildings; and (8) protection of parks and open space and their access to sunlight and vistas.

Prior to issuing a permit for any demolition, conversion, or change of use, and prior to taking any action that requires a finding of consistency with the *General Plan*, the City is required to find that such project or action would be consistent with the Priority Policies. The staff reports and approval motions prepared for the decision-makers will include a comprehensive project analysis and findings regarding the consistency of the Proposed Project with the Priority Policies. The consistency of the Proposed Project with plans and policies related to environmental topics associated with the Priority Policies is discussed in Chapter 4, Environmental Setting and Impacts, of this EIR (under Sections 4.B, Land Use and Land Use Planning; 4.C, Population and Housing; 4.D, Cultural Resources; 4.E, Transportation and Circulation; 4.I, Wind and Shadow; 4.J, Recreation; and 4.N, Geology and Soils).

Port of San Francisco

WATERFRONT LAND USE PLAN

Approved in June 1997, the Port of San Francisco's *Waterfront Land Use Plan* (WLUP) is a land use policy document governing property under the jurisdiction of the Port of San Francisco, generally from Fisherman's Wharf to India Basin.[7] (See Figure 2.1: Project Location, p. 2.6, which shows the boundaries of the Waterfront Land Use Plan Area in relation to the project site.) The project site is located within the *Waterfront Plan*'s Southern Waterfront Subarea (except for the Hoedown Yard, which is not under Port jurisdiction and therefore is not covered in the WLUP). The Southern Waterfront Subarea extends from Mariposa Street, just north of the project site, south to and including India Basin.[8] The WLUP contains the following objectives for the Southern Waterfront Subarea:[9]

- Maximize the utilization of existing cargo terminal facilities.
- Pursue financing mechanisms to develop competitively priced maritime support facilities in the Southern Waterfront.
- Maximize the productivity of Port assets through interim use of property reserved for maritime expansion.
- Development of non-maritime land uses that would be beneficial to the Port and compatible with maritime activities in areas which are surplus to long-term maritime needs.
- Promote non-maritime activities in and around three historic Union Iron Works buildings to facilitate the revitalization of an area that survives as an example of San Francisco's earliest maritime industry.

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[7] City and County of San Francisco, Port of San Francisco, *Waterfront Land Use Plan*, Revised Version, 2009 (hereinafter referred to as "*Revised WLUP*"). Available online at http://www.sfport.com/index.aspx?page=294. Accessed December 6, 2016.

[8] City and County of San Francisco, Port of San Francisco, *Revised WLUP*, Map of the Southern Waterfront Subarea, Revised Version, 2009, p. 163A.

[9] City and County of San Francisco, Port of San Francisco, *Revised WLUP*, pp. 155-161.

- Reserve or improve areas which will provide opportunities for the protection of wildlife habitat and for passive and active recreational uses.
- Enhance the public's appreciation of the waterfront by providing greater opportunities for access in a manner which does not compromise the efficiency of maritime operations.

The WLUP reserves most of the Pier 70 area for "Existing Maritime" or "Maritime Expansion" (roughly encompassing the 28-Acre Site within the project site and also the adjacent BAE Systems Ship Repair site).[10] According to the WLUP, "Maritime Uses consist of all uses, which depend on a waterfront location to operate all their related support and ancillary services and activities," including cargo shipping, ship repair, fishing industry, recreational boating and water use, ferry and excursion boats and water taxis, passenger cruise ships, historic ships, maritime support services, temporary and ceremonial berthing, and maritime office.[11] The WLUP identifies several maritime uses as "acceptable" uses within the Maritime areas in the Southern Waterfront Subarea.

The proposed residential, commercial, RALI, parking, and open space uses, under both the Maximum Residential Scenario and the Maximum Commercial Scenario, would be inconsistent with the "Existing Maritime" or "Maritime Expansion" designations under the WLUP.[12]

In addition to addressing the Port's maritime uses, WLUP policies designate "Mixed Use Opportunity Areas" (roughly encompassing the 20th/Illinois Parcel within the project site, and also the adjacent Historic Core and the site of future Crane Cove Park).[13] The Mixed Use Opportunity Area allows for development of several non-maritime commercial uses (artists/designers, assembly and entertainment, general office, museums, retail, recreational enterprises, warehousing/storage, and wholesale trade/promotion center).

Residential use is not among the acceptable uses within the Mixed Use Opportunity Area. Therefore, the Proposed Project's residential use under both the Maximum Residential Scenario and the Maximum Commercial Scenario would be inconsistent with the existing "Mixed Use Opportunity" designation under the WLUP.[14] To the extent that the Proposed Project could be inconsistent with certain provisions of the existing WLUP, in order to approve the Proposed Project, the San Francisco Port Commission would need to approve amendments to the WLUP as necessary to ensure consistency between the Proposed Project and the amended WLUP. In

[10] City and County of San Francisco, Port of San Francisco, *Revised WLUP*, Map A. Maritime Areas, p. 49A.
[11] City and County of San Francisco, Port of San Francisco, *Revised WLUP*, p. 48.
[12] City and County of San Francisco, Port of San Francisco, *Revised WLUP*, The Southern Waterfront Acceptable Land Use Table, p.162.
[13] City and County of San Francisco, Port of San Francisco, *Revised WLUP*, Map D. Waterfront Mixed Use Opportunity Areas, p. 81A.
[14] City and County of San Francisco, Port of San Francisco, *Revised WLUP*, The Southern Waterfront Acceptable Land Use Table, p.162.

2014-2015, Port staff completed the comprehensive WLUP *1997-2014 Review Report* and have developed a public process for targeted updates to the WLUP. Draft updates to the WLUP are anticipated in the spring of 2017.

PORT OF SAN FRANCISCO PIER 70 PREFERRED MASTER PLAN

Through a community-based planning process, the Port of San Francisco, with its Central Waterfront Advisory Group and a variety of interested stakeholders, developed the *Pier 70 Preferred Master Plan (Preferred Master Plan)*, dated April 2010.[15] The *Preferred Master Plan* was endorsed by the Port Commission in May 2010.[16]

The *Preferred Master Plan* articulates the following goals to provide a policy framework to guide Pier 70's transformation:

1. Create a Pier 70 National Register Historic District and rehabilitate its extraordinary historic resources.
2. Preserve the long-term viability of the ship repair industry.
3. Create a major new shoreline open space system that extends the San Francisco Bay Trail and the Blue Greenway to and through Pier 70.
4. Promote sustainable mixed-use infill development and economic vitality that includes climate adaptation strategies appropriate to this waterfront location.
5. Provide sites for office, research, emerging technologies, light industry, commercial, cultural, and recreational uses to expand San Francisco's economic base and generate revenues to fund public benefits.
6. Promote development that is pedestrian-oriented and fosters use of alternative, sustainable transportation modes and practices.
7. Extend the City street grid to enhance public access and integrate new development with the Central Waterfront.
8. Remediate environmental contamination to enable public use and enjoyment of Pier 70 and its waterfront and improve environmental quality.[17]

The Proposed Project would further many of these primary goals of the *Preferred Master Plan*. However, the Proposed Project differs from the plan in its implementation, particularly with respect to the density envisioned for new infill construction and the amount and location of residential use under the plan.

[15] Port of San Francisco, *Pier 70 Preferred Master Plan*, April 2010 (hereinafter referred to as "*Preferred Master Plan*").
[16] Port of San Francisco Port Commission, Resolution 10-27, "Request to authorize real estate developer solicitations to implement the April 2010 Preferred Master Plan for the Pier 70," May 11, 2010.
[17] Port of San Francisco, *Preferred Master Plan*, p. 3.

Density of Infill Construction

The *Preferred Master Plan* presents a Density Study Development Program to "test the capacity of development within the parameters established by the Plan and to inform the feasibility analysis."[18] The density study assumed 2,263,630 gross square feet (gsf) of new infill construction within the general area now covered by the 28-Acre Site, and 337,744 gsf of new infill construction within the general area now covered by the 20th/Illinois Parcel.[19] The plan notes that,

> evolving market opportunities and fluctuating development cycles may require varying approaches and design solutions to achieve these Plan goals and objectives. Thus, the Plan is not "hard-wired" or overly prescriptive in specifying a development program or physical siting of new development. The implementation strategy anticipates the need for an open, collaborative relationship with private development partner(s) and the community to determine how best to balance and achieve the Plan goals and objectives.[20]

The amount of infill construction proposed within the 28-Acre Site under the Proposed Project (3,410,830 gsf under the Maximum Residential Scenario and 3,422,265 gsf under the Maximum Commercial Scenario) would exceed the amount of new infill construction assumed for the general area under the *Preferred Master Plan* (an increase of around 50 percent under either scenario).

The amount of infill construction proposed within the 20th/Illinois Parcel under the Proposed Project (approximately 499,000 gsf under the Maximum Residential Scenario and approximately 500,200 gsf under the Maximum Commercial Scenario[21]) would exceed the amount of new infill construction assumed for the general area under the *Preferred Master Plan* (an increase of around 48 percent under either scenario).

Residential Use

To facilitate the continuation of heavy industrial ship repair operations within the adjacent BAE Systems Ship Repair site, the *Preferred Master Plan* contemplated limited residential use for the project site. The *Preferred Master Plan* did not envision any residential use within the 28-Acre

[18] Port of San Francisco, *Preferred Master Plan*, Table A1: Density Study Development Program, p. 110.
[19] Port of San Francisco, *Preferred Master Plan*, Table A1: Density Study Development Program, p. 110.
[20] Port of San Francisco, *Preferred Master Plan*, pp. 3-4.
[21] Under the Maximum Residential Scenario, proposed infill construction within the PKN Parcel would total 274,900 gsf (261,700 gsf residential + 6,600 gsf office + 6,600 gsf RALI), and proposed infill construction within the PKS parcel would total 224,100 gsf (213,100 gsf residential + 11,000 gsf RALI). Under the Maximum Commercial Scenario, proposed infill construction within the PKN Parcel would total 273,700 gsf (260,500 gsf residential + 6,600 gsf commercial + 6,600 gsf RALI), and proposed infill construction within the PKS Parcel would total 226,500 gsf (215,500 gsf residential + 11,000 GSF RALI).

Site. However, the *Preferred Master Plan* provides some opportunity for limited residential development along Illinois Street within the 20th/Illinois Parcel, but does not specify an amount.

> Pier 70 is not planned as a residential district. The continuation of heavy industrial operations for ship repair, which can involve loud, around-the-clock activities, generally conflicts with living standards and conditions conducive to significant new residential development. While the land use program primarily calls for non-residential activities, the Plan provides some opportunity for a limited amount of residential development along Illinois Street. One site is north of 20th Street near Crane Cove Park, across from existing housing developments. The other is the parcel just south of 20th Street along Illinois Street. These locations have been identified because they are close to public transit, can support new construction, are located upland away from the shipyard, and are near other residences. Proposals for housing would require thorough review of the design and program to demonstrate compatibility with the ship repair industry.[22]

The Proposed Project would be inconsistent with the land use program contemplated for the general area now occupied by the 28-Acre Site under the *Preferred Master Plan.* Under the proposed Maximum Residential Scenario, the 28-Acre Site would include up to 2,150 residential units. Under the proposed Maximum Commercial Scenario, the 28-Acre Site would include up to 1,100 residential units. However, the Proposed Project would be generally consistent with the land use program contemplated for the general area now occupied by the 20th/Illinois Parcel considered under the *Preferred Master Plan*.

B. REGIONAL PLANS AND POLICIES

Plan Bay Area

Plan Bay Area is a long-range integrated transportation and land use/housing strategy through 2040 for the San Francisco Bay Area and is considered the Sustainable Communities Strategy for the San Francisco Bay Area.[23] On July 18, 2013, *Plan Bay Area* was jointly approved by the Association of Bay Area Governments (ABAG) and by the Metropolitan Transportation Commission. *Plan Bay Area* marks the nine-county region's first long-range plan to meet the requirements of California's 2008 Senate Bill (SB) 375, which calls on each of the State's 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks. Working in collaboration with cities and counties, *Plan Bay Area* advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy.

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[22] Port of San Francisco, *Preferred Master Plan*, p. 49.

[23] Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission, *Plan Bay Area*. Available online at http://files.mtc.ca.gov.s3.amazonaws.com/pdf/Plan_Bay_Area_FINAL/pbafinal/index.html. Accessed January 4, 2016.

Since 2002, the regional population, household, and job forecast has been "policy-based," meaning that it promotes policy objectives that increase housing development and alternative transportation modes, specifically by increasing the proportion of growth near transit and in existing urban areas. With the adoption of SB 375 and its requirement that regional planning agencies create a plan to meet targets for greenhouse gas emissions reduction tied to land use, the Bay Area can expect to see further development directed towards existing urban areas like San Francisco to increase housing near jobs, reduce urban sprawl, and reduce greenhouse gas emissions.

These areas have been identified as Priority Development Areas (PDAs). A PDA is an infill location of at least 100 acres served by transit that is designated for compact land development, along with investments in community improvements and infrastructure. Under *Plan Bay Area*, 88 percent of population growth, 78 percent of new housing and 62 percent of new jobs in the Bay Area will be concentrated in PDAs.[24] The project site is located within the Port of San Francisco PDA, which includes approximately 678 acres of public waterfront lands and stretches 7.5 miles from Fisherman's Wharf to India Basin, adjacent to Hunters Point Shipyard in the Bayview/Hunters Point community. The Port of San Francisco PDA is one of 12 PDAs in the City where 88 percent of new housing production and population growth in the City is expected to take place. *Plan Bay Area* projects the creation of 1,497 residential units (households) by 2040 within the Port of San Francisco PDA.[25]

The Proposed Project under the Maximum Residential Scenario would provide 2,150 residential units within the 28-Acre Site and 540 residential units within the 20th/Illinois Parcel, for a total of 2,690 residential units within the Port of San Francisco PDA, and would alone exceed the growth projections for the entire Port of San Francisco PDA.[26]

Although the number of residential units under the Maximum Residential Scenario exceeds the specific growth projections for housing in the Port of San Francisco PDA, it is consistent with the overall goals of *Plan Bay Area* of accommodating future population growth within infill locations served by transit. *Plan Bay Area*'s projections serve more as targets for new infill development within PDAs rather than as limits to development. As such, the Proposed Project would enable the Port of San Francisco PDA to meet and exceed its targets for housing production under *Plan Bay Area*.

[24] ABAG, *Projections 2013*, July 2013, p. 71.

[25] ABAG, Plan Bay Area Priority Development Area Showcase, February 2015. Available online at http://gis.abag.ca.gov/website/PDAShowcase/. Accessed March 7, 2016.

[26] The Proposed Project under the Maximum Commercial Scenario would provide 1,100 residential units within the 28-Acre Site and 545 residential units within the Illinois Parcels, for a total of 1,654 residential units within the Port of San Francisco PDA, and would not alone exceed the growth projections for the entire Port of San Francisco PDA.

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC), created by the McAteer-Petris Act (California Government Code Sections 66600-66682), functions as the State's coastal management agency for San Francisco Bay. The *San Francisco Bay Plan* (*Bay Plan*) was prepared by BCDC from 1965 through 1969 and amended through 2007 in accordance with the McAteer-Petris Act. The *Bay Plan* guides the protection and use of the Bay and its shoreline. BCDC has permit jurisdiction for the nine Bay Area counties with Bay frontage over areas subject to tidal action up to the mean high tide line and including all sloughs, tidelands, submerged lands, and marshlands lying between the mean high tide and 5 feet above mean sea level, and the land lying between the Bay shoreline and a line drawn parallel to, and 100 feet from, the Bay shoreline, known as the 100-foot shoreline band. Under the McAteer-Petris Act, BCDC has permit authority for the placement of fill, extraction of materials, or substantial changes in use of land, water, or structures within its jurisdiction, and to enforce policies aimed at protecting the Bay and its shoreline, as well as maximizing public access to the Bay.

For the Proposed Project, BCDC's jurisdiction includes the Bay and areas within 100 feet inland of the mean high tide line. The Proposed Project would require BCDC approval of activities within BCDC's jurisdiction along the Bay shoreline. BCDC will make the final determination of consistency with *Bay Plan* policies for the portions of the project site that are within its permit jurisdiction.

San Francisco Bay Plan and San Francisco Waterfront Special Area Plan

BCDC completed and adopted the *Bay Plan* in 1968, and the plan has been periodically amended during the past 40 years, most recently in 2011 to address climate change. In 1975, after a collaborative planning process with the San Francisco Planning Department, BCDC adopted the *San Francisco Waterfront Special Area Plan* (*Special Area Plan*). The *Special Area Plan* was amended in 2012. This plan, together with the McAteer-Petris Act and the *Bay Plan* and subsequent amendments to all three documents, prescribes a set of rules for shoreline development along the San Francisco waterfront.

Several policies of the *Bay Plan* are aimed at protecting the Bay's water quality, managing safety of fills, and guiding the dredging activities of the Bay's sediment. The *Bay Plan* policies that are most relevant to the Proposed Project with respect to water quality and hydrology are as follows:

Water Quality

Policy 1: Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and

improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses.

Policy 2: Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Basin Plan. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the San Francisco Bay Regional Water Quality Control Board should be the basis for carrying out BCDC's water quality responsibilities.

Policy 3: New projects should be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain non-polluting materials; and (c) applying appropriate, accepted and effective best management practices, especially where water dispersion is poor and near shellfish beds and other significant biotic resources.

Policy 4: When approving a project in an area polluted with toxic or hazardous substances, the Commission should coordinate with appropriate local, state and federal agencies to ensure that the project will not cause harm to the public, to Bay resources, or to the beneficial uses of the Bay.

Policy 6: To protect the Bay and its tributaries from the water quality impacts of nonpoint source pollution, new development should be sited and designed consistent with standards in municipal stormwater permits and state and regional stormwater management guidelines, where applicable, and with the protection of Bay resources. To offset impacts from increased impervious areas and land disturbances, vegetated swales, permeable pavement materials, preservation of existing trees and vegetation, planting native vegetation and other appropriate measures should be evaluated and implemented where appropriate.

Policy 7: Whenever practicable, native vegetation buffer areas should be provided as part of a project to control pollutants from entering the Bay, and vegetation should be substituted for rock riprap, concrete, or other hard surface shoreline and bank erosion control methods where appropriate and practicable.

Climate Change

Policy 2: When planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared by a qualified engineer and should be based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current flood protection and planned flood protection that will be funded and constructed when needed to provide protection for the proposed project or shoreline area. A range of sea level rise projections for mid-century and end of century based on the best scientific data available should be used in the risk assessment. Inundation maps used for the risk assessment should be prepared under the direction of a qualified engineer. The risk assessment should identify all types of potential

flooding, degrees of uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices.

Policy 3: To protect public safety and ecosystem services, within areas that a risk assessment determines are vulnerable to future shoreline flooding that threatens public safety, all projects—other than repairs of existing facilities, small projects that do not increase risks to public safety, interim projects and infill projects within existing urbanized areas—should be designed to be resilient to a mid-century sea level rise projection. If it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise based on a risk assessment using the best available science-based projection for sea level rise at the end of the century.

Policy 4: To address the regional adverse impacts of climate change, undeveloped areas that are both vulnerable to future flooding and currently sustain significant habitats or species, or possess conditions that make the areas especially suitable for ecosystem enhancement, should be given special consideration for preservation and habitat enhancement and should be encouraged to be used for those purposes.

Policy 5: Wherever feasible and appropriate, effective, innovative sea level rise adaptation approaches should be encouraged.

Safety of Fills

Policy 2: Even if the Bay Plan indicates that a fill may be permissible, no fill or building should be constructed if hazards cannot be overcome adequately for the intended use in accordance with the criteria prescribed by the Engineering Criteria Review Board.

Policy 3: To provide vitally needed information on the effects of earthquakes on all kinds of soils, installation of strong-motion seismographs should be required on all future major landfills. In addition, the Commission encourages installation of strong-motion seismographs in other developments on problem soils, and in other areas recommended by the U.S. Geological Survey, for purposes of data comparison and evaluation.

Policy 4: Adequate measures should be provided to prevent damage from sea level rise and storm activity that may occur on fill or near the shoreline over the expected life of a project. The Commission may approve fill that is needed to provide flood protection for existing projects and uses. New projects on fill or near the shoreline should either be set back from the edge of the shore so that the project will not be subject to dynamic wave energy, be built so the bottom floor level of structures will be above a 100-year flood elevation that takes future sea level rise into account for the expected life of the project, be specifically designed to tolerate periodic flooding, or employ other effective means of addressing the impacts of future sea level rise and storm activity. Rights-of-way for levees or other structures protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay.

Shoreline Protection

Policy 1: New shoreline protection projects and the maintenance or reconstruction of existing projects and uses should be authorized if: (a) the project is necessary to provide flood or erosion protection for (i) existing development, use or infrastructure, or (ii) proposed development, use or infrastructure that is consistent with other Bay Plan policies; (b) the type of the protective structure is appropriate for the project site, the uses to be protected, and the erosion and flooding conditions at the site; (c) the project is properly engineered to provide erosion control and flood protection for the expected life of the project based on a 100-year flood event that takes future sea level rise into account; (d) the project is properly designed and constructed to prevent significant impediments to physical and visual public access; and (e) the protection is integrated with current or planned adjacent shoreline protection measures. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes, should participate in the design.

Policy 2: Riprap revetments, the most common shoreline protective structure, should be constructed of properly sized and placed material that meet[s] sound engineering criteria for durability, density, and porosity. Armor materials used in the revetment should be placed according to accepted engineering practice, and be free of extraneous material, such as debris and reinforcing steel. Generally, only engineered quarrystone or concrete pieces that have either been specially cast, are free of extraneous materials from demolition debris, and are carefully selected for size, density, and durability will meet these requirements. Riprap revetments constructed out of other debris materials should not be authorized.

Policy 3: Authorized protective projects should be regularly maintained according to a long-term maintenance program to assure that the shoreline will be protected from tidal erosion and flooding and that the effects of the shoreline protection project on natural resources during the life of the project will be the minimum necessary.

Policy 4: Whenever feasible and appropriate, shoreline protection projects should include provisions for nonstructural methods such as marsh vegetation and integrate shoreline protection and Bay ecosystem enhancement, using adaptive management. Along shorelines that support marsh vegetation, or where marsh establishment has a reasonable chance of success, the Commission should require that the design of authorized protection projects include[s] provisions for establishing marsh and transitional upland vegetation as part of the protective structure, wherever feasible.

Policy 5: Adverse impacts to natural resources and public access from new shoreline protection should be avoided. Where significant impacts cannot be avoided, mitigation or alternative public access should be provided.

Public Access

Policy 2: In addition to the public access to the Bay provided by waterfront parks, beaches, marinas, and fishing piers, maximum feasible access to and along the waterfront and on any permitted fills should be provided in and through

every new development in the Bay or on the shoreline, whether it be for housing, industry, port, airport, public facility, wildlife area, or other use, except in cases where public access would be clearly inconsistent with the project because of public safety considerations or significant use conflicts, including unavoidable, significant adverse effects on Bay natural resources. In these cases, in lieu access at another location preferably near the project should be provided.

Policy 5: Public access should be sited, designed, managed, and maintained to avoid significant adverse impacts from sea level rise and shoreline flooding.

Policy 9: Access to and along the waterfront should be provided by walkways, trails, or other appropriate means and connect to the nearest public thoroughfare where convenient parking or public transportation may be available. Diverse and interesting public access experiences should be provided which would encourage users to remain in the designated access areas to avoid or minimize potential adverse effects on wildlife and their habitat.

Policy 11: Federal, state, regional, and local jurisdictions, special districts, and the Commission should cooperate to provide appropriately sited, designed and managed public access, especially to link the entire series of shoreline parks, regional trail systems (such as the San Francisco Bay Trail) and existing public access areas to the extent feasible without additional Bay filling and without significant adverse effects on Bay natural resources. State, regional, and local agencies that approve projects should assure that provisions for public access to and along the shoreline are included as conditions of approval and that the access is consistent with the Commission's requirements and guidelines.

San Francisco Bay Water Quality Control Plan (Basin Plan)

San Francisco Bay waters are under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board, which established regulatory standards and objectives for water quality in the Bay in its *Water Quality Control Plan for the San Francisco Bay Basin*, commonly referred to as the *Basin Plan*.[27] The *Basin Plan* identifies existing and potential beneficial uses for surface waters and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the Federal Clean Water Act. Adoption or revision of surface water standards is subject to the approval of the U.S. Environmental Protection Agency. Because beneficial uses, together with their corresponding water quality objectives, can be defined per Federal regulations as water quality standards, the *Basin Plan* is a regulatory reference for meeting the State and Federal requirements for water quality control.

[27] San Francisco Bay Regional Water Quality Control Board, *Water Quality Control Plan for the San Francisco Bay Basin*, March 20, 2015. Available online at http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/planningtmdls/basinplan/web/docs/BP_all_chapters.pdf. Accessed November 28, 2015.

The project site is located adjacent to Lower San Francisco Bay, which extends from approximately the Bay Bridge on the north to the Dumbarton Bridge on the south. The combined sewer discharge structure for the 20th Street sub-basin of the City's combined sewer system discharges to the Central Basin, an inlet of Lower San Francisco Bay along the City's bay shoreline. Identified beneficial uses for the Central Basin of Lower San Francisco Bay are commercial and sport fishing, estuarine habitat, wildlife habitat, water contact recreation, noncontact water recreation, and navigation. Identified beneficial uses for Lower San Francisco Bay are industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation.

Total maximum daily loads for polychlorinated biphenyls (PCBs) and mercury in San Francisco Bay have been approved by the U.S. Environmental Protection Agency and officially incorporated into the *Basin Plan*.

C. STATE PLANS AND POLICIES

Public Trust Doctrine

The Public Trust Doctrine is a legal doctrine that governs the use of tidal and submerged lands, including former tidal and submerged lands that have been filled. It is not a codified set of laws but a doctrine primarily established in Court decisions and in decisions and interpretations by the California State Lands Commission and the California Attorney General. The purpose of the Public Trust Doctrine is to ensure that land that adjoins the State's waterways or is actually covered by those waters remains committed to water-oriented uses. Uses of Public Trust land are generally limited to waterborne commerce; navigation; fisheries; water-oriented recreation, including commercial facilities that must be located on or adjacent to water; and environmental preservation and recreation, such as natural resource protection, wildlife habitat and study, and facilities for fishing, swimming, and boating. Ancillary or incidental uses that promote Trust uses or accommodate the public's enjoyment of Trust lands are also permitted, such as hotels, restaurants, and specialty retail. Because the Public Trust Doctrine is based on judicial cases, there is no zoning code or general statute setting forth a list of permitted Trust uses.

Certain formerly tidal and submerged portions of the 28-Acre Site are subject to the Public Trust. (See Figure 2.3: Existing Public Trust Lands, in Chapter 2, Project Description, p. 2.14.) The proposed placement of certain non-Trust uses on land within the 28-Acre Site that is subject to the Public Trust would be inconsistent with the Public Trust. In order to resolve the Public Trust status of portions of Pier 70, the Port has obtained State legislation (Assembly Bill 418) that authorizes the State Lands Commission to approve a Public Trust exchange that would free some land from the Public Trust, while committing other land to the Public Trust. (See Figure 2.9: Proposed Public Trust Exchange Configuration, on p. 2.34.) For the City and Port to allow some

of the uses in the proposed SUD, the State Lands Commission would have to approve a Trust exchange agreement meeting the requirements of Assembly Bill 418 that would lift the Public Trust from designated portions of Pier 70.

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4. ENVIRONMENTAL SETTING AND IMPACTS

A. INTRODUCTION TO CHAPTER 4

Chapter 4, Environmental Setting and Impacts, addresses the physical environmental effects of the Proposed Project. This Introduction to Chapter 4 describes the format of the environmental analysis in each environmental topic section of the chapter; discusses the effect of Senate Bill 743 (SB 743) on the scope of California Environmental Quality Act (CEQA) analysis for the Pier 70 Mixed-Use District Project (Proposed Project); and explains the general approach to baseline setting and cumulative analysis in this Environmental Impact Report (EIR).

FORMAT OF THE ENVIRONMENTAL ANALYSIS

This chapter contains the following 17 sections in addition to this Introduction, each addressing a different environmental topic.

- Section 4.B, Land Use and Land Use Planning
- Section 4.C, Population and Housing
- Section 4.D, Cultural Resources
- Section 4.E, Transportation and Circulation
- Section 4.F, Noise and Vibration
- Section 4.G, Air Quality
- Section 4.H, Greenhouse Gas Emissions
- Section 4.I, Wind and Shadow
- Section 4.J, Recreation
- Section 4.K, Utilities and Service Systems
- Section 4.L, Public Services
- Section 4.M, Biological Resources
- Section 4.N, Geology and Soils
- Section 4.O, Hydrology and Water Quality
- Section 4.P, Hazards and Hazardous Materials
- Section 4.Q, Mineral and Energy Resources
- Section 4.R, Agriculture and Forest Resources

Each of these sections contains the following subsections: Environmental Setting, Regulatory Framework, and Impacts and Mitigation Measures.

The Environmental Setting subsection for each environmental topic defines and describes the existing conditions in the project site and vicinity as they relate to specifically to each of the topics. While typically existing conditions are generally defined as the physical conditions that existed at the time that the Notice of Preparation (NOP) for the Proposed Project is issued (CEQA Guidelines Section 15125(a)), existing conditions analyzed in the Pier 70 Mixed-Use District EIR include projects that are approved and under construction, which are reasonably likely to be

completed and occupied or in operation when the Proposed Project is expected to be implemented. As further described below on p. 4.A.5, the modified existing conditions serve as the baseline for the analysis of environmental impacts (adverse physical changes) that would result from implementation of the Proposed Project, presented under the Impacts and Mitigation Measures subsection.

The Regulatory Framework subsection describes Federal, State, regional, and local regulatory requirements that are directly applicable to the environmental topic.

The Impacts and Mitigation Measures subsection describes the physical environmental impacts of the Proposed Project for each topic, as well as any mitigation measures that could reduce impacts to less-than-significant levels. This subsection begins with a listing of the significance thresholds used to assess the severity of the environmental impacts for that particular topic. These thresholds reflect the Planning Department's Initial Study checklist. Environmental topic sections also include a topic-specific "Approach to Analysis," which follows the "Significance Thresholds" subsection. This discussion explains the parameters, assumptions, and data used in the analysis, and specifically outlines how the Maximum Residential Scenario and Maximum Commercial Scenario are analyzed in the each of the individual environmental topic sections. This is followed by a "Project Features" discussion, which summarizes the particular aspects of the Proposed Project relevant to each topic.

Under the "Impact Evaluation" discussion, the project-level impact analysis for each topic begins with an impact statement that reflects the applicable significance thresholds. Some significance thresholds may be combined in a single impact statement, if appropriate. Each impact statement is keyed to a subject area abbreviation (e.g., LU for Land Use) and an impact number (e.g., 1, 2, 3) for a combined alpha-numeric code (e.g., Impact LU-1, Impact LU-2, Impact LU-3). When potentially significant impacts are identified, mitigation measures are presented to avoid, eliminate, or reduce significant adverse impacts of the project. Improvement measures are identified that would further reduce less-than-significant effects of the Proposed Project. Each mitigation measure corresponds to the impact statement and has an "M" in front to signify it is a mitigation measure (e.g., Mitigation Measure M-LU-1 for a mitigation measure that corresponds to Impact LU-1). If there is more than one mitigation measure for the same impact statement, the mitigation measures are numbered with a lowercase letter suffix (e.g., Mitigation Measures M-LU-1a and M-LU-1b). Improvement measures are designated with an "I" to signify "improvement measure," the topic code, and a letter (e.g., I-LU-A).

Each impact statement describes the impact that would occur without mitigation. The level of significance of the impact is indicated in parentheses at the end of the impact statement based on the following terms:

- **No Impact** – No adverse physical changes (or impacts) to the environment are expected.
- **Less than Significant** – Impact that does not exceed the defined significance criteria or would be eliminated or reduced to a less-than-significant level through compliance with existing local, State, and Federal laws and regulations.
- **Less than Significant with Mitigation** – Impact that is reduced to a less-than-significant level through implementation of the identified mitigation measures.
- **Significant and Unavoidable with Mitigation** – Impact that exceeds the defined significance criteria and can be reduced through compliance with existing local, State, and Federal laws and regulations and/or implementation of all feasible mitigation measures, but cannot be reduced to a less-than-significant level.
- **Significant and Unavoidable** – Impact that exceeds the defined significance criteria and cannot be eliminated or reduced to a less-than-significant level through compliance with existing local, State, and Federal laws and regulations and for which there are no feasible mitigation measures.

The Proposed Project's cumulatively considerable contributions to cumulative impacts are described in a separate subsection following the project-level impact analysis for each environmental topic. Cumulative impact statements are numbered consecutively for each impact statement with a combined alpha-numeric code to signify it is a cumulative impact. For example, C-LU-1 refers to the first cumulative impact for Land Use and Land Use Planning.

PUBLIC RESOURCES CODE SECTION 21099

Aesthetics and Parking Analysis

CEQA Section 21099(d), provides that "aesthetics and parking impacts of a residential, mixed-use residential, or employment center project on an infill site located within a transit priority area shall not be considered significant impacts on the environment." Accordingly, aesthetics and parking are not considered in determining if a project has the potential to result in significant environmental effects for projects that meet all of the following three criteria:

1. The project is in a transit priority area[1]; and
2. The project is on an infill site; and
3. The project is residential, mixed-use residential, or an employment center.

[1] A "transit priority area" is defined as an area within one-half mile of an existing or planned major transit stop. A "major transit stop" is defined in California Public Resources Code Section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. A map of San Francisco's Transit Priority Areas is available online at http://sfmea.sfplanning.org/Map%20of%20San%20Francisco%20Transit%20Priority%20Areas.pdf.

The Proposed Project meets each of the above three criteria and thus, this EIR does not consider aesthetics and the adequacy of parking in determining the significance of project impacts under CEQA.[2]

The Planning Department recognizes that the public and decision-makers nonetheless may be interested in information pertaining to the aesthetic effects of a proposed project and may desire that such information be provided as part of the environmental review process. Therefore, some information that would have otherwise been provided in an aesthetics section of the EIR (i.e., "before" and "after" visual simulations) has been included in Section 4.C, Cultural Resources, of this EIR. However, this information is provided solely for informational purposes and is not used to determine the significance of the environmental impacts of the project, pursuant to CEQA. In addition, Public Resources Code Section 21099(d)(2) states that a Lead Agency maintains the authority to consider aesthetic impacts pursuant to local design review ordinances or other discretionary powers and that aesthetics impacts do not include impacts on historical or cultural resources (e.g., historic architectural resources). As such, the Planning Department does consider aesthetics for design review and to evaluate effects on historic and cultural resources.

The Planning Department acknowledges that parking conditions may be of interest to the public and the decision-makers. Therefore, this EIR presents parking demand analysis for informational purposes and considers any secondary physical impacts associated with constrained supply (e.g., queuing by drivers waiting for scarce on-site parking spaces that affects the public right-of-way) as applicable in the transportation analysis in Section 4.E, Transportation and Circulation.

Automobile Delay and Vehicle Miles Traveled Analysis

In addition, Public Resources Code Section 21099(b)(1) requires that the State Office of Planning and Research (OPR) develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Public Resources Code Section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts pursuant to Section 21099(b)(1), automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment under CEQA.

[2] San Francisco Planning Department, *Transit-Oriented Infill Project Eligibility Checklist*, Pier 70 Mixed Use Project, Case No. 2014-001272ENV, November 18, 2015. A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2005.0679E.

In January 2016, OPR published for public review and comment a *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*[3] recommending that transportation impacts for projects be measured using a vehicle miles traveled (VMT) metric. On March 3, 2016, based on compelling evidence in that document and on the City's independent review of the literature on level of service and VMT, the San Francisco Planning Commission adopted OPR's recommendation to use the VMT metric instead of automobile delay to evaluate the transportation impacts of projects (Resolution 19579). The VMT metric does not apply to the analysis of impacts on non-automobile modes of travel such as riding transit, walking, and bicycling.

Accordingly, this EIR does not contain a discussion of automobile delay impacts. Instead, a VMT and induced automobile travel impact analysis is provided in Section 4.E, Transportation and Circulation. The topic of automobile delay, nonetheless, may be considered by decision-makers, independent of the environmental review process, as part of their decision to approve, modify, or disapprove the proposed project.

APPROACH TO BASELINE SETTING

Project development characteristics are typically compared to the existing physical environment to isolate impacts caused by the project on its surroundings. In other words, the existing condition (also referred to as the environmental setting) is normally the baseline against which the project's impacts are measured to determine whether impacts are significant. Therefore, the Environmental Setting subsection of each topic describes existing conditions on and around the project site. These existing conditions are ordinarily established as of the date that the NOP is published. In some circumstances, however, it is appropriate to use a different baseline to identify project impacts to account for circumstances that can change over time during the course of the environmental review, project construction, and operation.

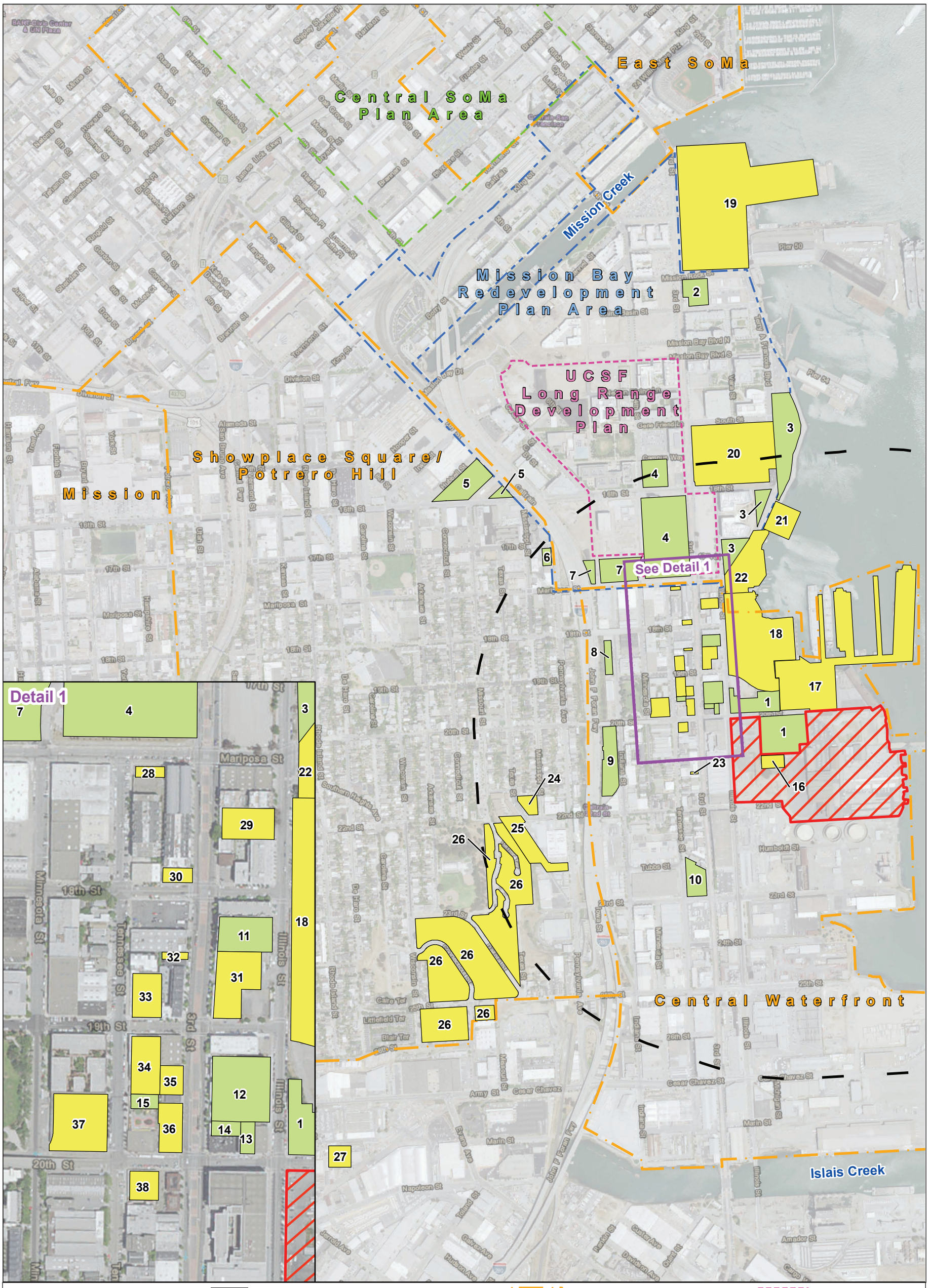
The Central Waterfront, Mission Bay, and Dogpatch neighborhoods are currently undergoing rapid changes and development. For both development scenarios, construction is projected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve five phases. The Proposed Project is likely to be constructed well after a number of approved transportation improvements and land use development projects are implemented. These projects were under construction as of the date of the publication of the NOP or are approved and are reasonably likely to be completed and occupied or in operation when the Proposed Project is expected to be implemented. The adjusted "existing conditions" that include these development projects form an appropriate baseline

[3] San Francisco Planning Department, *Transit-Oriented Infill Project Eligibility Checklist*, Pier 70 Mixed Use Project, Case No. 2014-001272ENV, dated November 18, 2015.

against which the Pier 70 Mixed-Use Project should be measured for many of the analysis topics in the EIR, rather than using the existing conditions as of the time the NOP was published.

Presented below is a list of the development projects included in the baseline for the analyses of topics for which a baseline other than existing conditions is appropriate. The number of the project listed below corresponds to its numbered location on Figure 4.A.1: Location of Baseline and Foreseeable Future Projects. The figure shows the location of baseline projects within the vicinity of the project site. Baseline projects are shown in green. Figure 4.A.1 also corresponds to the locations of projects for which the Planning Department had an application on file, but for which construction had not commenced as of NOP publication of the Proposed Project. Such projects are considered additional reasonably foreseeable future projects and are discussed in cumulative impact analysis below in the "Approach to Cumulative Analysis" on pp. 4.A.12-4.A.18. Cumulative, "foreseeable future" projects are shown in yellow on the figure.

For most environmental topics, projects included in the baseline or cumulative analysis are no greater than an approximate one-half-mile radius from the project site. However, for issues related to transportation and circulation, several projects located within a reasonable distance of the project site (between approximately Interstate 280 [I-280] to the west, Cesar Chavez Street to the south, and Bryant Street to the north) were completed and began operation after traffic counts were taken at the transportation study intersections (these intersections are identified in Section 4.E, Transportation and Circulation, and shown on Figure 4.E.1: Transportation Study Area and Study Intersections, p. 4.E.2). These projects are adding traffic to local roadways and freeway ramps and to the local transit system; therefore, the trips generated by these projects have also been added to existing conditions to provide a final adjusted baseline for the traffic analysis and traffic-related air quality and noise analyses in order to properly reflect conditions against which the Proposed Project will be analyzed. Other projects outside the one-half-mile radius related to sanitary sewer facilities have also been considered in the analysis in Section 4.K, Utilities and Service Systems.



Source: San Francisco Planning Department (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.A.1: LOCATION OF BASELINE AND FORESEEABLE FUTURE PROJECTS

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Adjacent Pier 70 Baseline Project

1. **20th Street Historic Core Project, Case No. 2013.1168E:**

   This project will renovate, remediate, and reuse ten Port-owned historic industrial buildings and develop an outdoor publicly accessible plaza located at Pier 70 along portions of 20th Street between Illinois and Louisiana streets. The ten historic buildings (Buildings 14, 101, 102, 104, 113, 114, 115, 116, 122, and 123) are contributors to the Union Iron Works Historic District, individually eligible historic resources, and historic architectural resources under CEQA. Buildings will be reused as primarily light industrial and commercial uses. The project will add approximately 69,000 gross square feet (gsf) of new building space primarily in interior mezzanines, and remove approximately 5,000 gsf of previous additions to Buildings 104 and 113. Roadway, sidewalk, and parking lot improvements will also occur. In total, this project includes approximately 334,000 gsf of existing and new building space.

   Approved and under construction 2014, planned to be operational 2017.

Baseline Projects within Approximately One-Half Mile of the Project Site

2. **1245 Third Street (Public Safety Building):**

   The project involved the construction of an approximately 285,000-gsf Public Safety Building to house San Francisco Police Department Headquarters-South District Police Station and Fire Station #4.

   Constructed 2011 and operational 2015.

3. **Bayfront Park:**

   The project will construct a park from four parcels (P21, P22, P23, and P24) owned by the Port in the Mission Bay Redevelopment Area. P21 and P22 are located east of Terry Francois Boulevard between South and Mariposa streets. P21 is an existing 1.83 acre area featuring a boat launch with a parking lot, and a 300-foot-long portion of the San Francisco Bay Trail. P22 is partially developed by a 990-foot-long, 8-foot-wide continuation of the San Francisco Bay Trail (0.18 acre). An additional 5.22 acres of P22 will be developed (5.4 acres total) to include a new grass lawn and other amenities to complement the existing trail and waterfront. P23 (0.76 acre) and P24 (1.13 acres) are two triangular parcels located west of Terry Francois Boulevard between Mariposa and 16th streets that will be developed into new park spaces.

   Approved 2016 and under construction.

4. **University of California, San Francisco (UCSF) Medical Center Hospital and Mission Bay Hall:**

   The UCSF Medical Center Hospital is located in Mission Bay between Third, Fourth, 16th, and Mariposa streets and includes a new 878,000 gsf hospital complex with 289 beds (183 in UCSF Benioff Children's Hospital San Francisco, 36 in UCSF Betty Irene Moore Women's Hospital birth center, and 70 in UCSF Bakar Cancer Hospital). Mission Bay Hall is located at the northwestern corner of Third and 16th streets and includes a seven-floor, 265,000-gsf building for the university's global health programs and offices.

   Mission Bay Hall constructed 2013 and operational October 2014, Medical Center Hospital constructed 2010 and operational as of February 2015, after traffic counts were completed for the transportation analysis.

5. **1000 16th Street, Case No. 2003.0527E:**

   The mixed-use project includes approximately 453 residential and 39 commercial units with ground-floor retail space, and an approximately 0.9-acre public park.

   Constructed 2014 and operational December 2015.

6. **1001 17th Street/140 Pennsylvania Street, Case No. 2011.0187E:**

   The project calls for demolition of a two-story warehouse and construction of two new buildings: a mixed-use, 36-unit residential and commercial building at 1001 17th Street and a mixed-use, 12-unit residential and commercial building at 140 Pennsylvania Avenue.

   Approved 2013 and operational November 2015.

7. **Mariposa Park:**

   The project constructed a 2.38 acre park from of two parcels (P26 and P27) owned by the City in the Mission Bay Redevelopment Area. The park, located north of Mariposa Street between Minnesota Street and I-280, will provide a grass lawn and walking paths, a kids play area, and benches and tables.

   Approved 2009 and operational July 2016.

8. **650 Indiana Street, Case No. 2012.1574E:**
   The project includes demolition of the existing structures and construction of approximately 114,700 gsf with 111 residential units and approximately 1,900 gsf of ground-floor neighborhood-serving retail uses. The project has two approximately 58-foot-tall, five-story buildings, separated by a mid-block alleyway. The buildings include approximately 79 parking spaces and 103 Class 1 bicycle spaces, as well as building services and storage space. The project also includes construction of an 8,200 gsf public plaza on the portion of 19th Street located west of Indiana Street and streetscape improvements pursuant to the City's Better Streets Plan.

   Approved 2014, under construction 2015, planned to be operational 2017.

9. **800 Indiana Street, Case No. 2011.1374E:**

   This project includes demolition of the existing two-story industrial warehouse and one-story office and construction of a five-story residential building with 338 dwelling units and up to 230 parking spaces. The project will include 37,775 gsf of publicly accessible open space.

   Approved 2015, under construction 2016, planned to be operational 2018.

10. **1201–1225 Tennessee Street, Case No. 2012.0493E:**

    The project will demolish the existing commercial building and construct a six-story mixed use building with 259 dwelling units, 2,260 ground-floor retail space, and 147 off-street parking spaces.

    Approved 2015 and under construction.

11. **740 Illinois Street/2121 Third Street, Case No. 2010.0094E:**

    Under this project, the existing commercial fueling facility was demolished and a new building, with approximately 106 dwelling units and 80 parking spaces, was constructed. The new building is six stories tall and totals approximately 62,516 gsf.

    Constructed and operational 2013.

12. **2235 Third Street, Case No. 2002.1302E:**

    Under this project, two existing vacant buildings totaling about 27,200 gsf were renovated and an approximately 180,000 gsf addition was constructed. The development has approximately 141 dwelling units with 128 off-street parking spaces and approximately 10,000 gsf of ground-floor retail space.

    Constructed and operational 2012.

13. **616 20th Street, Case No. 2006.0427E:**

    This project included demolition of an existing one-story restaurant and construction of 16 dwelling units over a ground-floor restaurant with 11 parking spaces. A portion of the building is in use as the Dogpatch Alternative School [Site 2].

    Constructed and operational 2013.

14. **2265 Third Street (Dogpatch Alternative School [Site 1]):**

    The project conducted tenant improvements to an existing building to facilitate a change in use from retail to school.

    Constructed and operational 2013.

15. **851 Tennessee Street, Case No. 2013.0775E:**

    Under this project new Italian International School facilities were constructed.

    Constructed and operational 2013.

This baseline setting is used where relevant in the analyses of the Proposed Project's impacts in the Land Use, Transportation and Circulation, Noise, Air Quality, Wind and Shadow, Recreation (Parks only), and Biological Resources sections presented in Sections B, E, F, G, I, J, and M, respectively, of Chapter 4, Environmental Setting and Impacts.

In addition, the traffic and transit analyses, and the transportation-related analyses in the Noise and Air Quality sections of the EIR (Sections 4.F and 4.G, respectively), account for the following transportation improvements that are under construction or are approved and funded and are expected to be completed and in use by the time the Pier 70 Mixed-Use Development Project is implemented:

- Central Subway (*under construction, planned to be operational 2019*).
- Muni bus route 55 16th Street (*operational January 2015*).
- Mariposa Street infrastructure upgrades and Owens Street extension (part of UCSF Mission Bay Medical Center improvements) consisting of:
  - Owens Street extension between 16th and Mariposa streets to connect with the I-280 ramps;
  - Mariposa Street widening on the north side near the I-280 ramps;
  - Northbound I-280 off-ramp widening at Mariposa Street to better align with Owens Street;
  - Mariposa Street restriping between I-280 off-ramp and Pennsylvania Avenue; and
  - Mariposa Street/I-280 on-ramp intersection signalization.

- Muni bus route 22 Fillmore extension east on 16th Street to Third Street and north on Third Street to a turnaround in Mission Bay, and Muni bus route 33 Stanyan re-routed from Potrero Avenue to provide service on 18th Street presently provided by the 22 Fillmore. (*Planned to be operational 2020.*)
- Transit-only travel lane on 16th Street. (*Planned to be operational 2019.*)
- T Third Muni Metro line short loop on new tracks in Mission Bay around the block of 18th, Illinois, and 19th streets and leading back to Third Street, to allow short runs during peak periods and special events when the Central Subway begins operation extending the T Third north into Chinatown and adding capacity north of the loop.[4] (*Under construction July 2016, planned to be completed 2018.*)

This baseline, including the development projects and transportation system improvements listed above, added to existing conditions, present a reasonable representation of conditions expected in the project vicinity at the time the Proposed Project is implemented. The Proposed Project's potential traffic and transit impacts, and transportation-related air quality and noise impacts have been analyzed against this baseline rather than to existing land use and transportation conditions to avoid providing misleading information about impacts to the public and decision-makers.

Forecast-based analyses, such as the analyses prepared for Section 4.C, Population and Housing and Section 4.J, Recreation,[5] relate the Project-generated impacts to the existing conditions as compared to region-wide population and housing projections, rather than the sum of individual development projects to create an updated "baseline." The development projects listed for the baseline conditions are instead already included in forecasts of future growth in population that are the basis for the analyses of population-related impacts and Project-generated demand for various services such as recreational facilities, wastewater facilities, and water supply.

APPROACH TO CUMULATIVE IMPACT ANALYSIS

Cumulative impacts are two or more individual effects which, when considered together, are considerable or which compound or increase environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. Cumulative impacts are impacts of the project in combination with other closely related past, present, and reasonably foreseeable probable future projects (CEQA Guidelines Section 15355(a)(b)). The following factors are considered to determine the level of cumulative analysis in this EIR:

[4] The T Third loop has been approved by the SFMTA Board of Directors and is in litigation. Analysis of the baseline conditions assumes that issues are resolved and the loop tracks will be constructed prior to construction of the Proposed Project.

[5] For the purposes of understanding acreage of open space available at a local level, baseline park and recreation facility projects under construction as of the date of NOP or are approved and are reasonably likely to be completed and occupied or in operation when the Proposed Project is expected to be implemented are considered in Section 4.J, Recreation.

- **Similar Environmental Impacts** – A relevant project contributes to effects on resources that are also affected by a proposed project. A relevant future project is defined as one that is "reasonably foreseeable," such as a proposed project for which an application has been filed with the approving agency or has approved funding.
- **Geographic Scope and Location** – A relevant project is located within the geographic area within which effects could combine. The geographic scope varies on a resource-by-resource basis. For example, the geographic scope for evaluating cumulative effects to air quality consists of the affected air basin.
- **Timing and Duration of Implementation** – Effects associated with activities for a relevant project (e.g., short-term construction or demolition, or long-term operations) would likely coincide in timing with the related effects of a proposed project.

CEQA Guidelines Section 15130(b)(1) sets forth two primary approaches to the analysis of cumulative impacts. The analysis can be based on (1) a list of past, present, and probable future projects producing related impacts that could combine with those of a proposed project, or (2) a summary of projections contained in a general plan or related planning document. For the purposes of this EIR, past projects are established within existing conditions and present projects approved or under construction but not yet fully operational as of NOP publication are discussed as a part of the baseline as established above. Any additional reasonably foreseeable future projects are considered further in cumulative impact analysis. Cumulative impact analysis in San Francisco generally employs both a list-based approach and a projections approach, depending on which approach best suits the individual resource topic being analyzed.

List-Based Approach

The cumulative analyses for those topics using a list-based approach (such as Noise, and Wind and Shadow) typically consider individual projects from a list of nearby future projects anticipated in the project area. The particular projects to be considered in the cumulative analysis for each topic varies by environmental topic, and is appropriately tailored to the particular environmental topic based on the potential for combined localized environmental impacts under the topic.

Presented below is a numbered list of reasonably foreseeable future projects. Generally, these are projects for which the Planning Department had an application on file as of publication of the NOP for the Proposed Project (May 6, 2015), but for which construction had not commenced as of NOP publication and/or projects that the Planning Department has otherwise determined are reasonably feasible. The number shown for each project listed below corresponds to its numbered location on Figure 4.A.1 on p. 4.A.7. Cumulative projects are shown on the figure in yellow.

Adjacent Pier 70 Foreseeable Future Projects

16. **20th Street Historic Core Building 40 and 117, Case No. 2016-000346ENV.** The project, proposed by the Port in 2015, would add the demolition of Buildings 40 and 117, totaling approximately 40,000 gsf, to the 20th Street Historic Core project.[6] Building 40 is located north of the Pier 70 Mixed-Use District project site, on the BAE Ship Repair facility site; Building 40 is proposed for demolition because it is located in the alignment of the proposed sidewalk along the frontage of the future Crane Cove Park. Building 117 is located on the Pier 70 Mixed-Use District project site, and abuts the southern boundary of the 20th Street Historic Core site; Building 117 is proposed for demolition as part of the 20th Street Historic Core project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code. Both Buildings 40 and 117 are contributors to the Union Iron Works Historic District, individually eligible historic resources, and historic architectural resources under CEQA.

17. **SF Port BAE Lease Renewal, Case No. 2014.0713E.** The project would include renewal of the lease for BAE Ship Repair facility, which calls for the removal of 12 polychlorinated biphenyl electrical transformers and demolition of three buildings: Building 38 (Pipe and Electric Shop), Building 119 (Yard Washroom), and Building 121 (Drydock Office). In addition, the project would demolish Cranes Nos. 2 and 6. The project would involve routine maintenance and repairs approximately for a six-week duration once every 18 months over a seven-year period.

18. **Crane Cove Park, Case No. 2015-001314ENV.** The project includes construction of a new, approximately 9.8-acre shoreline park; an extension of 19th Street for park access and circulation; creation of Georgia Street, which would connect 20th Street to the 19th Street extension; relocation of the BAE Ship Repair site entrance from 20th Street to the terminus of the 19th Street extension and rerouting BAE Ship Repair truck traffic from 20th Street to the 19th Street extension; and street improvements along the eastern side of Illinois Street. Phase 1 of construction, underway in fall 2016, is anticipated to be completed January 2018. Phase 2 is estimated to occur between 2026 and 2028.

Foreseeable Future Projects within Approximately One-Half Mile of the Project Site

19. **Seawall Lot 337/Pier 48 (Mission Rock Development), Case No. 2013.0208E.** The Mission Rock development proposed on Seawall Lot 337 and Pier 48 would include a mixed-use development, including open space, commercial, residential, retail, and parking. The project would have approximately 3,600,000 gsf of development including 1,700,000 gsf of commercial use such as office space, 650 to 1,500 residential units, 150,000 to 250,000 gsf of retail or entertainment use, 700 accessory parking spaces, and a parking structure with 2,300 parking stalls. The project would involve the rehabilitation and reuse of Pier 48.

20. **Golden State Warriors Event Center and Mixed Use Development, Case No. 2014.1441E.** The project will involve construction of a multi-purpose event center

[6] The Port filed an application to demolish Building 117 on January 7, 2016, Case No. 2016-000346ENV. Any approval of the demolition of Building 117 will undergo appropriate environmental review, as required by CEQA. San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

and a variety of mixed uses, including office, retail, open space, and structured parking on an approximately 11-acre site within the Mission Bay Redevelopment Plan Area. The proposed event center would host the Golden State Warriors basketball team during the annual National Basketball Association season (generally between October and April), as well as provide a year-round venue for a variety of other uses, including concerts, family shows, other sporting and cultural events, conferences, and conventions.

21. **Mission Bay Ferry Landing.** The project would include construction of a new ferry terminal near 16th Street and Terry Francois Boulevard. The terminal would provide capacity to berth two ferries simultaneously and potentially a nearby water taxi landing to provide regional access to the new UCSF Mission Bay hospital and campus, the Golden State Warriors arena, and the surrounding neighborhoods.
22. **Mariposa Pump Station Interim Repairs, Case No. 2014-002522ENV.** The project will replace an existing 12-inch-diameter sewer pipe with new 24-inch-diameter high-density polyethylene pipe within the same alignment of existing pipe, which runs east-west in the intersection of Terry Francois Boulevard, Mariposa Street, and Illinois Street, on the southern side of a large sub-surface concrete transport/storage sewer box. The project will also replace an existing manhole associated with the Mariposa Pump Station. Proposed modifications to an existing 20-inch force main and the Mariposa Pump Station also include a new 14-inch-diameter force main that will connect the pump station to the existing 20-inch force main.
23. **2420 Third Street, Case No. 2013.0673E.** The project would involve construction of a three-story with mezzanine mixed-use building with nine residential units and one ground-level commercial unit. The project would have no off-street parking and 12 bicycle parking spaces.
24. **645 Texas Street, Case No. 2012.1218E.** The project will involve demolition of two existing one and two-story structures and construction of a new four-story, 94-dwelling unit residential project over 64 off-street parking spaces. The proposed building will be 45 feet in height.
25. **790 Pennsylvania Avenue / 1395 22nd Street, Case No. 2011.0671E.** The project will include construction of a mixed-use building with 251 dwelling units, 29,780 gsf of Production, Distribution, Repair (PDR), and 205 off-street parking spaces.
26. **Potrero Hope SF Master Plan, Case No. 2010.0515E.** The project would involve replacement of 606 units of public housing with 1,400 to 1,700 units of mixed-income, mixed-tenure housing, including 1-to-1 replacement of public housing. The project would also include neighborhood-serving retail, community facilities, parks and open space, and a new street network.
27. **Kansas and Marin Streets Sewer Improvements.** The project would construct a new 18-by-24-by-15-foot transport and storage box to improve the sewer system conveyance from the Islais Creek watershed east of Highway 101 to the Islais Creek transport and storage box. Acquisition of new right-of-way would be required.
28. **595 Mariposa Street, Case No. 2014.1579ENV.** The project would involve building upon an existing surface parking lot and constructing a five-story residential building containing 20 dwelling units with a combination of private and common open space. Net new construction will be 16,757 gsf.

29. **2051 Third Street / 650 Illinois Street, Case No. 2010.0726E.** The project will involve demolition of existing structures and construction of a new six-story, 65.4-foot-tall building with 71,225 gsf of residential (97 dwellings) and 45 off-street parking spaces.
30. **2092 Third Street / 600 18th Street, Case No. 2014.0168E.** The project would involve demolition of the existing buildings and construction of a new six-story, 68-foot-tall (84-foot-tall with mechanical penthouse), 20,540 gsf building consisting of 18 dwelling units, 3,064 gsf of ground-floor retail, 13 parking spaces, and 18 bicycle parking spaces.
31. **2177 Third Street / 590 19th Street, Case No. 2013.0784E.** The project will involve demolition of the two existing industrial/office buildings on the 29,438 gsf subject lot and construction of two seven-story, 68-foot-tall residential buildings. The proposed new buildings will have approximately 154,509 gsf of space and will include 109 dwelling units, 3,143 gsf of ground-floor retail space, and 91 parking spaces. Parking will be provided at the basement level with access from 19th Street. The project will include common open space on a podium level above the parking level and on the roof, with pedestrian bridges connecting the two buildings at each level including the roof.
32. **2146 Third Street, Case No. 2013.1109E.** The project will involve demolition of an existing building and construction of a residential building approximately 12,000 gsf in size and containing seven residential units, ranging approximately 500 to 1,200 gsf in size. The proposed building will be six stories above a basement level and would extend approximately 55 feet in height. Below grade, the project would repurpose the existing basement level as a garage with four parking spaces.
33. **777 Tennessee Street, Case No. 2013.0312E.** The project will involve the demolition of an existing two-story light industrial building and construction of a new multi-family building. The proposed new building will include 59 dwelling units over below-grade parking with 49 off-street parking spaces.
34. **815-825 Tennessee Street, Case No. 2013.0220E.** The project will involve demolition of the two-story, 815-825 Tennessee Street buildings, retaining the brick façade on the corner of Tennessee and 19th streets (listed as a known historic resource in the Central Waterfront Survey), and construction of a new six-story apartment building with subterranean parking using conventional parking and parking stackers. The new building will be 58 feet tall and will have 69 dwelling units and 48-off street parking spaces.
35. **2230 Third Street, Case No. 2013.0531E.** The project would involve demolition of an existing commercial warehouse building and construction of a new seven-story mixed-use commercial and residential building with ground-floor commercial/residential flex space with 37 dwellings units and 23 parking spaces.
36. **2290 Third Street, Case No. 2005.0408E.** The project would involve demolition of an existing one-story commercial building and construction of a six-story, mixed-use building with 80 dwelling units, 80 off-street parking spaces, and approximately 14,000 gsf of ground-floor commercial use.
37. **888 Tennessee Street / 890 Tennessee Street, Case No. 2013.0975E.** The project would involve demolition of an existing two-story building and construction of two four-story residential-over-retail building containing 110 dwelling units, 3,800 gsf of retail use, and 10,073 gsf of courtyard open space. The new building would include a 35,752-gsf below-grade parking garage with 93 off-street parking spaces.

38. **901 Tennessee Street, Case No. 2013.0321E.** The project will include demolition of an existing one-story warehouse and construction of a new four-story residential building. The building will consist of four residential levels with 39 dwelling units over a basement level with mechanical spaces and 30 off-street parking spaces.

Projections Approach

The cumulative analysis in Section 4.C, Population and Housing, relies on population forecasts presented in Association of Bay Area Government (ABAG) Citywide growth in *Projections 2013*. ABAG forecasts account for San Francisco County Priority Development Area Projects that are currently in various stages of the entitlement process, construction, and occupation.[7] Cumulative analysis in Section 4.J, Recreation also relies on ABAG's *Projections 2013* to estimate population forecasts and demand on open space and recreation facilities, but includes list-based cumulative projects of proposed future public open space relevant to the local cumulative setting.

The cumulative analysis in Section 4.E, Transportation and Circulation, relies on a Citywide growth projection model provided by the San Francisco County Transportation Authority known as the SF-CHAMP travel demand model that projects reasonably foreseeable growth in 2040 based on known and forecast development. SF-CHAMP encompasses adopted area plans and many individual projects anticipated in the project vicinity. The projections model includes many of the larger, individual projects and applies a quantitative growth factor to account for other growth that may occur. Several area plans have identified the southeastern part of the San Francisco as the location for substantial future growth in housing and employment. Examples of projects that are accounted for in the growth forecast are described in the "List-Based Approach" as well as area plans such as the *Eastern Neighborhoods Plan*, *Western SOMA Community Plan*, *Mission Bay Redevelopment Plan*, and the *Central SOMA Plan*.

The *Eastern Neighborhoods Plan* includes four area plans: the *Central Waterfront Area Plan* (which includes the project site); the *Showplace Square / Potrero Area Plan* (west of the I-280 Freeway); the *Mission Area Plan* (west of Potrero Avenue); and the *East SOMA Area Plan* (north of Mission Bay). The rezoning under the *Eastern Neighborhoods Plan* would increase the potential for residential development on infill sites in the Eastern Neighborhoods over what would have been available under the previous zoning between approximately 7,400 units to 9,900 units. The rezoning would also result in a net increase of non-residential space (excluding PDR loss) by about 3,200,000 to 6,600,000 gsf and decrease the potential sites available for PDR growth compared to previous zoning.

[7] A Priority Development Area is an infill location of at least 100 acres served by transit that is designated for compact land development, along with investments in community improvements and infrastructure.

The 303-acre *Mission Bay Redevelopment Plan* area is north of the project site. The plan was adopted in 1998. It envisioned a mixed-use, transit-oriented neighborhood that would include 6,000 housing units, 4.4 million gsf of office/research/commercial space, 500,000 gsf of retail space, public parks, a school, a library, a fire station, and a UCSF research campus, generally bounded by Mariposa, Owens, and Illinois streets and Mission Bay Boulevard South. The Mission Bay UCSF campus within Mission Bay is also the subject of a *UCSF Long Range Development Plan*. Much of the *Mission Bay Redevelopment Plan* has been built out over the last 17 years since adoption of the plan.

The *Central SOMA Plan* (*Central Corridor Plan)* is a draft plan, originally published in 2013 and revised in August 2016, that envisions substantial transit-oriented growth south of Market Street bounded by Second Street in the east, Sixth Street in the west, Townsend Street to the south, and an irregular northern border that follows south of Folsom Street, south of Clementina Street between Fourth and Fifth streets, generally south of Natoma Street between Fifth and Sixth streets, and along the eastern boundary of Sixth Street north to Stevenson Street. This area includes portions of the Downtown and Mission Bay areas, and has access to diverse transit options. The plan calls for an increase in the growth potential from 8,225 residential units and 3,827,445 gsf of commercial use under existing zoning, to 11,715 residential units and 9,391145 gsf of commercial use, respectively. The *Central SOMA Plan* may be adopted as early as fall 2017.

B. LAND USE AND LAND USE PLANNING

Section 4.B, Land Use and Land Use Planning, examines the effects of the Proposed Project related to land use and land use planning. The Environmental Setting discussion describes the existing land uses within, and in the vicinity of, the project site. The Regulatory Framework discussion identifies applicable local, regional, and State plans and policies. The Impacts and Mitigation discussion identifies the significance criteria for land use and land use planning impacts, identifies the project features pertaining to the topic of Land Use and Land Use Planning, discusses the effects on existing land use that would occur if the Proposed Project were implemented, and discusses the cumulative land use effects of the Proposed Project in combination with other proposed, planned, or reasonably foreseeable future projects.

ENVIRONMENTAL SETTING

EXISTING PROJECT SITE

The project site occupies the southern portion of the Pier 70 area, as shown on Figure 2.1: Project Location, in Chapter 2, Project Description, p. 2.6. The 69-acre Pier 70 area is owned by the Port of San Francisco and encompasses an historic shipyard property along San Francisco's Central Waterfront. Most of Pier 70 (66 of the total 69 acres) is listed on the National Register of Historic Places as the Union Iron Works Historic District.[1] Portions of Pier 70 are still used today for ship repair operations, as well as for other industrial operations. The southwest corner of the project site (the 3.6-acre Hoedown Yard) is outside of the Pier 70 area and is owned by the Pacific Gas and Electricity Company (PG&E).

As discussed in Chapter 3, Plans and Policies, several local, regional, and State plans and policies are applicable to the project site or portions of it: the *San Francisco General Plan*; the *General Plan's Central Waterfront Area Plan*; the Port of San Francisco's *Waterfront Land Use Plan* (WLUP); the Port of San Francisco's *Pier 70 Preferred Master Plan*; the Association of Bay Area Governments' *Plan Bay Area*; the San Francisco Bay Conservation and Development Commission's *Bay Plan*; and the Public Trust Doctrine, administered by the State Lands Commission.

[1] United States Department of the Interior, National Park Service, National Register of Historic Places Registration Form, *Union Iron Works Historic District*, April 17, 2014.

The project site is zoned P (Public) and M-2 (Heavy Industrial), as shown on Figure 4.B.1: Existing Use Districts in the Project Vicinity.[2] As discussed in Chapter 3, Plans and Policies, on pp. 3.3-3.4, and shown on Figure 4.B.2: Existing Height and Bulk Districts in the Project Vicinity, the westernmost portion of the project site along Illinois Street is currently within a 65-X Height and Bulk District. The remainder of the project site (encompassing the 28-Acre Site and the eastern portion of the Hoedown Yard) is currently in a 40-X Height and Bulk District.

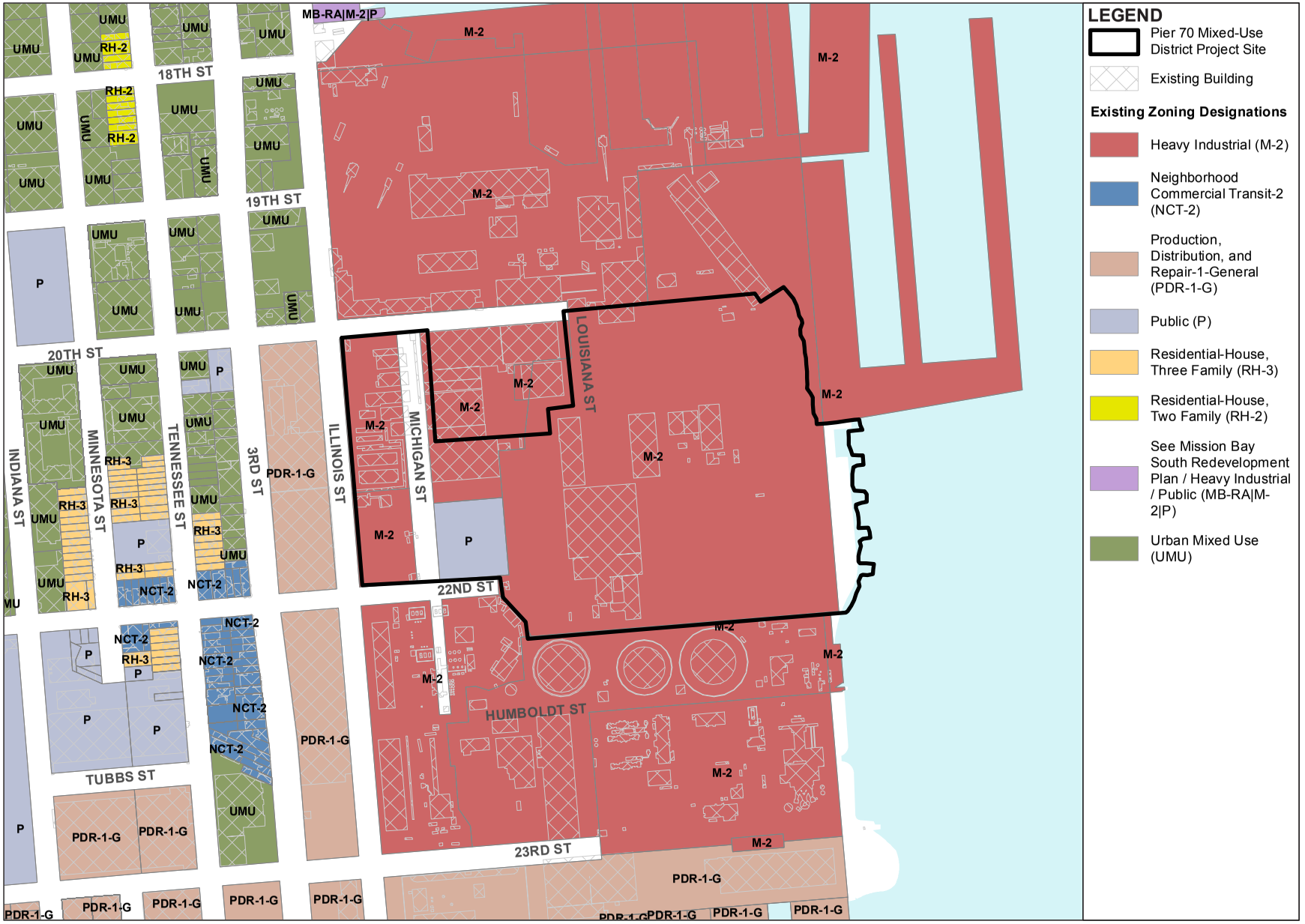
The project site currently contains approximately 351,600 gross square feet (gsf) of deteriorating buildings and facilities. Current uses on the site, all of which are temporary, include special event venues, artists' studios, self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, and office spaces, as further described below.

28-Acre Site

The existing buildings on the 28-Acre Site are mostly low- to mid-rise (45- to 82-foot-tall) structures. (See Figure 4.B.3: Existing Building Heights in the Project Vicinity. See also Figure 2.2: Existing Site Plan, p. 2.11.) The Port has entered into interim leases for all of the useable buildings. Current uses of these buildings are as follows:

- Building 2, formerly Warehouse No. 2, a warehouse space, is leased by Paul's Stores for storage.
- Building 11, known as the Noonan Building and previously used as administration and design offices for the World War II shipbuilding yard, is currently leased as artists' studios and office space.
- The Building 12 complex and the paved lot to the west of the complex are licensed by Forest City from the Port (authorized by the Revocable License Agreement for Special Events) for community, arts and cultural, and special events. The complex, which was once used for producing ship hull plates from templates, is made up of five buildings: Building 12 (former Plate Shop No. 2), Building 15 (former Layout Yard), Building 16 (former Stress Relieving Building), Building 25 (former washroom and lockers), and Building 32 (former Template Warehouse).
- Building 19 is currently part of the BAE Systems lease premises and is used to store sandblasting grit. Under the BAE lease, Building 19 will be removed from the BAE leasehold as part of BAE's shipyard master plan, which is still under development.
- Building 21, an electrical substation and a former Risdon Iron and Locomotive Works and Pacific Rolling Mill Company building, is leased to the SOMArts Cultural Center for storage.

[2] Planning Code Section 210.4: M-2 Districts (Heavy Industrial). These Districts are the least restricted as to use and are located at the eastern edge of the City, separated from residential and commercial areas. The heavier industries are permitted, with fewer requirements as to screening and enclosure than in M-1 Districts, but many of these uses are permitted only as conditional uses or at a considerable distance from Residential Districts. Most of the land zoned M-2 is controlled by the Port of San Francisco.



Source: San Francisco Planning Department (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

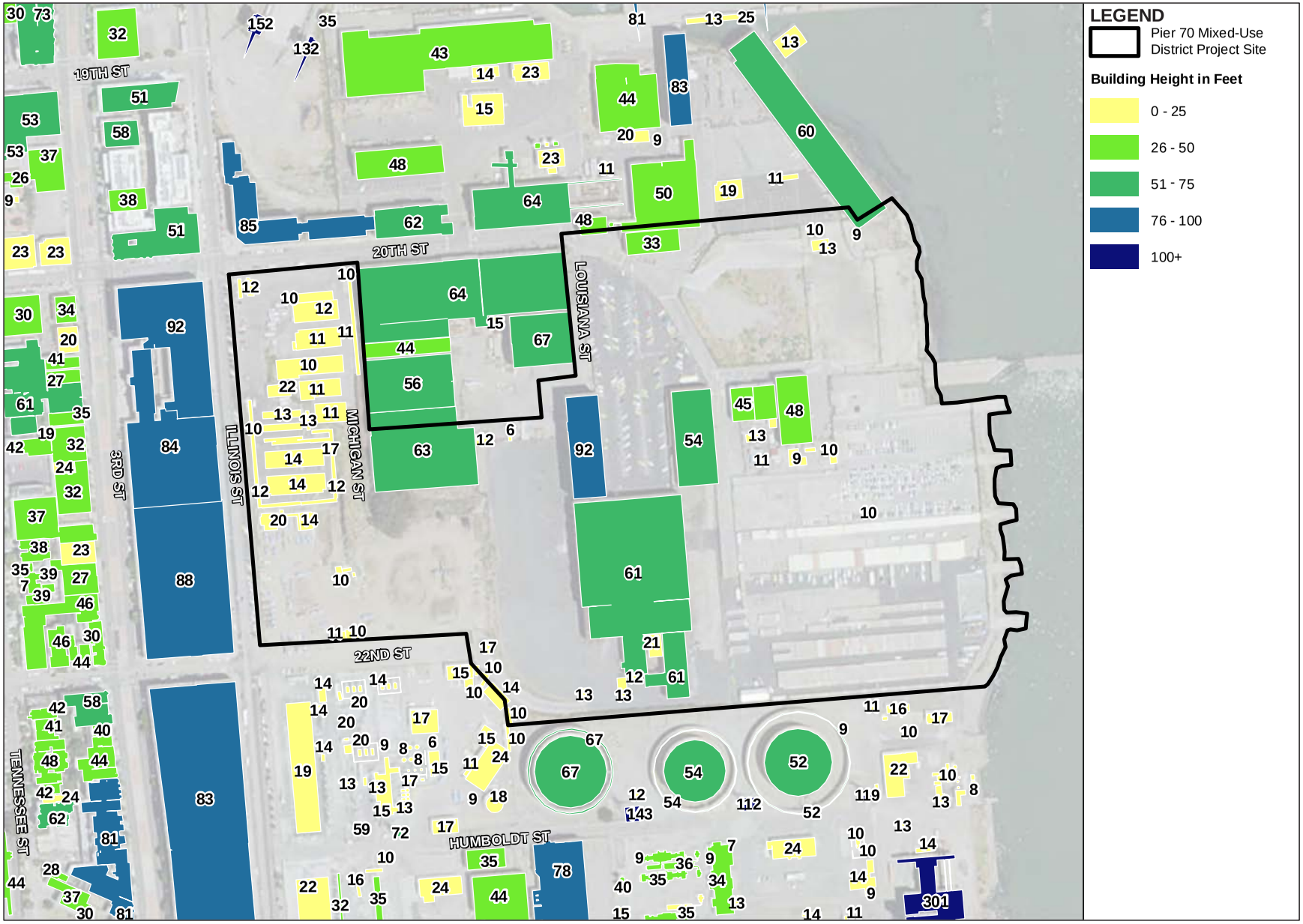
FIGURE 4.B.1: EXISTING USE DISTRICTS IN THE PROJECT VICINITY



Source: San Francisco Planning Department (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.B.2: EXISTING HEIGHT AND BULK DISTRICTS IN THE PROJECT VICINITY



Source: San Francisco Planning Department (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.B.3: EXISTING BUILDING HEIGHTS IN THE PROJECT VICINITY

- Building 66, the former Welding Shed, and the paved parking lots located along and to the west of Building 2 are leased to Yellow Cab for taxi cab storage.
- Building 117, formerly a shipyard training center, is leased by the Delancey Street Foundation for storage.[3]

The Port has also leased certain portions of the land within the project site, including four former slipways, Slipways 5, 6, 7, and 8, on the 28-Acre Site, which have been filled and paved. Current uses are as follows:

- East of Building 19 is an asphalt area containing a privately owned radio antenna.
- Paved land in the northeast corner of the project site, the site of a former metal recycling facility, is subleased by Affordable Self Storage.
- West of Building 11 (the Noonan Building), SOMArts and Ernest Rivera lease paved land for storage.
- North of the Building 12 complex, Yellow Cab leases paved land to park taxicabs.
- Affordable Self Storage leases the southeastern corner of the slipways, which includes rows of self-storage lockers. Immediately north of Affordable Self Storage, Boas International leases an area for new automobile storage.

Illinois Parcels

20th/Illinois Parcel

The 20th/Illinois Parcel is owned by the Port. It is a paved area with asphalt lots used for paid parking, construction lay-down, and other temporary uses. In March 2015, the Port and FC Pier 70, LLC, a Forest City affiliate, entered into a lease for approximately 1 acre of paved industrial land on the southern portion of the 20th/Illinois Parcel for retail activities such as a beer garden, food trucks, and food carts and a variety of cultural, educational, and recreational activities, including special events. A remaining section of Irish Hill is located in the southeast corner of the 20th/Illinois Parcel.

Hoedown Yard

South of the 20th/Illinois Parcel, the PG&E-owned Hoedown Yard is used for soil recycling and construction equipment storage. A remaining section of Irish Hill is located in the northeast

[3] Building 117, totaling 30,940 gsf, is located on the project site; however, the Port has proposed to demolish this building separately and prior to approval of the Proposed Project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code. The Port filed an application to demolish Building 117 on January 7, 2016, Case No. 2016-000346ENV. Any approval of the demolition of Building 117 will undergo appropriate environmental review, as required by CEQA.

corner of the Hoedown Yard. The Hoedown Yard is outside of the 69-acre Pier 70 boundary, but it is included in the project site and proposed Special Use District (SUD).

PROJECT VICINITY

As discussed in Section 4.A, Introduction to Chapter 4, on pp. 4.A.17-4.A.18, several area plans have identified the southeastern part of San Francisco as the location for substantial future growth in housing and employment. The *Eastern Neighborhoods Rezoning and Area Plan* (*Eastern Neighborhoods Area Plan*) includes four area plans: the *Central Waterfront Area Plan* (which includes the project site); the *Showplace Square / Potrero Area Plan* (west of the Interstate 280 [I-280] Freeway); the *Mission Area Plan* (west of Potrero Avenue); and the *East SOMA Area Plan* (north of Mission Bay). The rezoning under the *Eastern Neighborhoods Plan* has increased the residential potential of infill sites in the Eastern Neighborhoods over what would have been available under the previous zoning, thereby decreasing the potential sites available for production, distribution, and repair (PDR) uses. Other plans for southeastern San Francisco include the *Mission Bay Redevelopment Projects North and South,* the *UCSF Long Range Development Plan,* and the *Central Corridor Plan* (Central SOMA Plan).

The project site is located along San Francisco's Central Waterfront, just south of Mission Bay South and east of the Potrero Hill and Dogpatch neighborhoods. The Central Waterfront is predominantly devoted to light and heavy PDR uses, including maritime-related uses, construction, transportation, warehousing/distribution, and printing and publishing.

To the North of the Project Site

Adjacent Land Uses

Consistent with the existing zoning within most of the project site, adjacent areas to the north of the project site on Pier 70 are zoned M-2 (Heavy Industrial). Consistent with the height and bulk districts within the project site, the areas immediately to the north of the project site are in a 65-X Height and Bulk District along Illinois Street, and in a 40-X Height and Bulk District eastward to the Bay.

The adjacent 7.6-acre Pier 70 20th Street Historic Core is north of the project site and contains a concentration of the most historically and architecturally significant contributors to the Union Iron Works National Register Historic District. The Historic Core contains about 270,000 square feet of largely vacant industrial and office space currently undergoing rehabilitation for adaptive reuse. The portion of the Historic Core to the south of 20th Street is surrounded by the project site to the east, south, and west and includes five buildings: Buildings 113-114, the Union Iron Works Machine Shop buildings along the south side of 20th Street; Buildings 115-116, the Foundry and Warehouse buildings; and Building 14, the Heavy Warehouse building. The portion of the

Historic Core along the north side of 20th Street includes three buildings. From west to east, they are Building 101, the Bethlehem Steel Administration building at the northeast corner of Illinois Street and 20th Street; Building 102, the Powerhouse building; and Building 104, the Union Iron Works Administration building.

20TH STREET HISTORIC CORE PROJECT

The 20th Street Historic Core Project[4] includes repair and rehabilitation of eight buildings in the Pier 70 Historic Core (Buildings 101, 102, 104, 112, 113, 115, 116, and 14) to satisfy current seismic, structural, and code requirements; reuse of the buildings as primarily light industrial and commercial uses, with one residential unit;[5] and addition of approximately 69,000 gsf of new building space. The project also includes an outdoor publicly accessible plaza and roadway, sidewalk, and parking lot improvements. In total, the project would include approximately 334,000 gsf of existing and new building space. The 20th Street Historic Core Project also includes demolition of Buildings 117 and 40.

SITE OF THE FUTURE CRANE COVE PARK

Farther north of the Historic Core is the site of the future Crane Cove Park, which is also part of Pier 70 and Port of San Francisco property.[6] Construction of the approximately 9-acre park is underway. The park would include lawn areas and shoreline access, and would incorporate the historic Slipway 4 and two historic cranes. That project would also include extension of 19th Street for park access and circulation; creation of Georgia Street, which would connect 20th Street to the 19th Street extension; relocation of the BAE Systems Ship Repair Facility entrance from 20th Street to the terminus of the 19th Street extension and rerouting of BAE Shipyard truck traffic from 20th Street to the 19th Street extension; and street improvements along the eastern side of Illinois Street.

BAE SHIP REPAIR FACILITY

To the north of the 20th Street alignment, and adjacent to the eastern portion of the project site (the 28-Acre Site), is the BAE Systems Ship Repair facility, a 17-acre site that BAE leases from the Port of San Francisco. The facility includes support buildings and lay-down areas north on

[4] San Francisco Planning Department, Certificate of Determination, Exemption from Environmental Review, 400-600 20th Street, Pier 70 ("20th Street Historic Core"), Case No. 2013.1168E, May 7, 2014.

[5] See Table 4.F.4: Sensitive Receptors in the Project Vicinity, in Section 4.F, Noise, on p. 4.F.15. Address: 628 20th Street.

[6] San Francisco Planning Department, Certificate of Determination, Exemption from Environmental Review, Crane Cove Park, Case No. 2015.001314ENV, October 5, 2015.

land and piers and floating drydocks farther north within the Bay. BAE's lease renewal,[7] approved by the Port Commission on March 24, 2015,[8] includes removal of 12 PCB electrical transformers and demolition of three buildings: Building 38 (Pipe and Electric Shop), Building 119 (Yard Washroom), and Building 121 (Drydock Office). In addition, the project would demolish Crane Nos. 2 and 6.

Mission Bay

Farther north is the 303-acre *Mission Bay Redevelopment Plan* area. The plan was adopted in 1998. It envisioned a mixed-use, transit-oriented neighborhood that would include about 6,000 housing units, 4.4 million square feet of office/research/commercial space, about 500,000 square feet of retail space, public parks, a school, a library, a fire station, and a University of San Francisco (UCSF) research campus. The Mission Bay UCSF campus within Mission Bay is also the subject of the *UCSF Long Range Development Plan*. Much of the *Mission Bay Redevelopment Plan* area has been built out over the last 17 years since adoption of the plan. UCSF Medical Center Hospital / Mission Bay Hall has been constructed and is in operation. The Golden State Warriors Event Center and Mixed Use Development Project, to be located at Third and 16th streets, was approved in December 2015.

To the West of the Project Site

As discussed in Chapter 3, Plans and Policies, on p. 3.2, the project site and neighboring Dogpatch neighborhood are within the area covered by the *Central Waterfront Area Plan*, one of the four plan areas of the *Eastern Neighborhoods Area Plan*, which was adopted in 2009. The Eastern Neighborhoods contain much of the City's industrially zoned land and have been transitioning to other uses over the past several decades. One of the goals of the Eastern Neighborhoods planning effort was to find a balance between growth of housing and office uses and preservation of PDR facilities.[9] As discussed in Section 4.A, Introduction to Chapter 4, a number of recent, primarily residential, projects have been constructed (see "Approach to Baseline Setting," on pp. 4.A.5-4.A.12) and others are proposed (see "Approach to Cumulative Impact Analysis," on pp. 4.A.12-4.A.18) in the Dogpatch neighborhood to the west in keeping with implementation of the *Central Waterfront Area Plan*.

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[7] San Francisco Planning Department, Certificate of Determination, Exemption from Environmental Review, SF Port – Pier 70 Area – BAE Lease Renewal, Case No. 2014.0713, March 2, 2015.

[8] San Francisco Port Commission, Resolution 15-11, adopted March 24, 2015.

[9] The *Central Waterfront Area Plan* did not revise any zoning and height controls for the Pier 70 area, deferring to the Port's Pier 70 area planning process which was ongoing when the *Central Waterfront Area Plan* was in preparation.

Along the West Side of Illinois Street

To the west of the project site, across Illinois Street, is the American Industrial Center, a four-story, 84- to 92-foot-tall complex that occupies two entire blocks bounded by Illinois Street, 20th Street to the north, 23rd Street to the south, and Third Street to the east. The American Industrial Center complex is zoned PDR-1-G (Production, Distribution and Repair-1-General).[10] The blocks along the west side of Illinois Street and the east side of Third Street are in a 68-X Height and Bulk District, except for an area at 23rd Street, which is in an 85-X Height and Bulk District.

The facility comprises about 900,000 square feet of commercial, industrial, and related supporting uses. The American Industrial Center currently leases space to approximately 300 tenants engaged in various commercial and industrial activities.[11] The facility houses breweries, commercial kitchens and bakeries, garment manufacturing businesses, warehouses, and distribution centers. At the ground floor, recessed off-street loading bays line the west side of Illinois Street across from the project site.

The area north of 20th Street and west of Illinois Street is zoned UMU (Urban Mixed Use).[12] At the northwest corner of 20th and Illinois streets is a two-story commercial building at 600 20th Street. Farther west along 20th Street is a recently completed project at 616-620 20th Street, a five-story, 16-unit residential building. Farther north along the west side of Illinois Street, at 810-820 Illinois Street (a.k.a. 2235 Third Street), is a recently constructed, approximately 141-unit residential building with ground-floor retail. Farther north, at the southwest corner of the 19th and Illinois streets, is a three-story commercial building built in 1919.

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[10] Planning Code Section 210.10: PDR-1-G Districts (Production, Distribution and Repair-1-General). The intention of this district is to retain and encourage existing production, distribution, and repair activities and promote new business formation. Thus, this district prohibits residential and office uses and limits retail and institutional uses. Additionally, this district allows for more intensive production, distribution, and repair activities than PDR-1-B and PDR-1-D but less intensive than PDR-2. Generally, all other uses are permitted. In considering any new land use not contemplated in this district, the Zoning Administrator shall take into account the intent of this district as expressed in this section and in the *General Plan*.

[11] Charles J. Higley, Farrella Braun+Martel, representing American Industrial Center, Letter Re: Pier 70 Mixed Use District – EIR Scoping Comments, June 5, 2015.

[12] Planning Code Section 853: UMU Districts (Urban Mixed Use). This district is intended to promote a vibrant mixture of uses while maintaining the characteristics of this formerly industrially zoned area. It is also intended to serve as a buffer between residential districts and PDR districts in the Eastern Neighborhoods. Within the UMU, allowed uses include production, distribution, and repair uses such as light manufacturing, home and business services, arts activities, warehouse, and wholesaling. Additional permitted uses include retail, educational facilities, and nighttime entertainment. Housing is also permitted, but is subject to higher affordability requirements. Family-sized dwelling units are encouraged. Within the UMU, office uses are restricted to the upper floors of multiple-story buildings.

West of Third Street

Farther west, the area west of Third Street includes a mixture of zoning districts reflecting its mixed-use character, including UMU (Urban Mixed Use), PDR-1-G (Production, Distribution and Repair-1-General), P (Public), NCT-2 (Neighborhood Commercial Transit-2),[13] RH-2 (Residential House, Two Family),[14] and RH-3 (Residential House, Three Family).[15] Two parks are in this area: Esprit Park, three blocks to the west of the project site along the north side of 20th Street at Minnesota Street, and Woods Yard Park, three blocks to the west of the project site along the south side of 22nd Street at Minnesota Street.

The west side of Third Street is in a 68-X Height and Bulk District except for a segment south of 20th Street, which is in a 45-X Height and Bulk District. Areas farther west, along Tennessee and Minnesota streets, are within 40-X, 45-C, 50-X, 58-X, and 68-X Height and Bulk Districts.

The area includes a wide variety of uses and a finely mixed development pattern. Parcel sizes are smaller than the American Industrial Center blocks and areas east of Illinois Street. Uses include printing and publishing, graphic design, building materials sales, light warehousing, wholesale, import/export, and auto repair. There is a small cluster of older houses on Tennessee Street. There are also several loft-style residential buildings, most of them new construction and others in converted industrial buildings. The Dogpatch neighborhood is a primarily residential enclave dating to the late 1800s. There are a number of mixed-use buildings with ground-floor commercial space on 22nd Street, which serves as the neighborhood's commercial spine. Third

[13] Planning Code Section 734: NC-2 Districts (Neighborhood Commercial Transit-2). NCT-2 Districts are transit-oriented mixed-use neighborhoods with small-scale commercial uses near transit services. The NCT-2 Districts are mixed-use districts that support neighborhood-serving commercial uses on lower floors and housing above. These districts are well-served by public transit and aim to maximize residential and commercial opportunities on or near major transit services. NCT-2 Districts are intended to provide convenience goods and services to the surrounding neighborhoods as well as limited comparison shopping goods for a wider market. The range of comparison goods and services offered is varied and often includes specialty retail stores, restaurants, and neighborhood-serving offices.

[14] Planning Code Section 209.1: RH-2 Districts (Residential House, Two Family). These districts are devoted to one-family and two-family houses, with the latter commonly consisting of two large flats, one occupied by the owner and the other available for rental. Structures are finely scaled and usually do not exceed 25 feet in width or 40 feet in height. Building styles are often more varied than in single-family areas, but certain streets and tracts are quite uniform. Considerable ground-level open space is available, and it frequently is private for each unit. The districts may have easy access to shopping facilities and transit lines. In some cases, Group Housing and institutions are found in these areas, although nonresidential uses tend to be quite limited.

[15] Planning Code Section 209.1: RH-3 Districts (Residential House, Three Family). These districts have many similarities to RH-2 Districts, but structures with three units are common in addition to one-family and two-family houses. The predominant form is large flats rather than apartments, with lots 25 feet wide, a fine or moderate scale, and separate entrances for each unit. Building styles tend to be varied but complementary to one another. Outdoor space is available at ground level, and also on decks and balconies for individual units. Nonresidential uses are more common in these areas than in RH-2 Districts.

Street between 22nd and 23rd streets also has a concentration of residential and small-scale retail/entertainment uses.

Potrero Hill

I-280, which runs north-south about 0.25 mile west of the project site, and its on- and off-ramps create a physical and visual barrier separating the mixed-use Dogpatch neighborhood from the residential Potrero Hill neighborhood farther to the west. Potrero Hill is another of the four plan areas of the *Eastern Neighborhoods Area Plan.* The blocks west of the freeway are zoned primarily RH-2 (Residential House, Two Family) District. They also include areas zoned RH-3 (Residential House, Three Family) District, NC-2 (Neighborhood Commercial-2) Districts along 18th Street and 20th Street, MUR (Mixed Use Residential) District, and P (Public) District. The area is in a 40-X Height and Bulk District.

To the South of the Project Site

Consistent with the existing zoning within most of the project site, adjacent areas to the south of the project site are zoned M-2 (Heavy Industrial) and are in a 65-X Height and Bulk District along Illinois Street, and in a 40-X Height and Bulk District eastward to the Bay.

The area adjacent to Pier 70 is occupied by PG&E's Potrero Substation (a functioning high-voltage transmission substation serving San Francisco), the decommissioned Potrero Power Plant, and the TransBay Cable converter station, which connects the Pittsburg-San Francisco 400-megawatt direct-current, underwater electric transmission cable to PG&E's electricity transmission grid by way of the Potrero Substation, and industrial lands farther south.

REGULATORY FRAMEWORK

Chapter 3, Plans and Policies, discusses the local, regional, and State land use regulatory framework applicable to the Proposed Project under the following plans and policies.

SAN FRANCISCO GENERAL PLAN

The *San Francisco General Plan* (*General Plan*) is the embodiment of the City's vision for the future of San Francisco. It provides general policies and objectives to guide land use decisions and contains some policies that relate to physical environmental issues. The *General Plan* comprises a series of ten elements, each of which pertains to a particular topic that applies Citywide: Air Quality, Arts, Commerce and Industry, Community Facilities, Community Safety, Environmental Protection, Housing, Recreation and Open Space, Transportation, and Urban Design.

The *General Plan* also includes area plans, each of which focuses on a particular area of the City, including the *Central Waterfront Plan*, in which the project site is located. Except for the western portion of the project site along the east side of Illinois Street, which was rezoned from 40-X to 65-X Height and Bulk District, the *Central Waterfront Plan* did not revise zoning and height controls for the majority of the Pier 70 area, deferring to the Port's Pier 70 area planning process which was ongoing when the *Central Waterfront Area Plan* was in preparation.

SAN FRANCISCO PLANNING CODE

Use Districts

As shown on Figure 4.B.1, p. 4.B.3, the project site is zoned P (Public) in the eastern portion of the Hoedown Yard within the Illinois Parcels, and the rest of the project site is zoned M-2 (Heavy Industrial). Most of the proposed land uses within the project site (residential, commercial, and retail/arts/light-industrial [RALI][16]) are inconsistent with the existing P (Public) and/or the M-2 (Heavy Industrial) zoning on the project site.

To implement the Proposed Project, the Zoning Maps would be amended to provide changes from the current zoning P (Public) and M-2 (Heavy Industrial) districts to the proposed SUD zoning. The proposed Pier 70 SUD would establish development controls for the project site through incorporation of the design standards and guidelines set forth in the proposed *Pier 70 SUD Design for Development* document which is included as part of the Proposed Project.

Height and Bulk Districts

As shown in Figure 4.B.2, p. 4.B.4, within the Illinois Parcels, the westernmost portion of the project site is currently within a 65-X Height and Bulk District. The remainder of the project site (encompassing the 28-Acre Site and the eastern portion of the Hoedown Yard within the Illinois Parcels) is currently within a 40-X Height and Bulk District. Bulk controls (i.e., limits on horizontal building dimensions) do not apply within an "X" Bulk District.

On June 3, 2014, San Francisco voters approved Proposition B, a ballot measure which requires Citywide voter approval for any future construction projects on Port-owned San Francisco waterfront property that exceed height limits in effect on January 1, 2014. Subsequently, on November 4, 2014, the San Francisco electorate approved Proposition F, a ballot measure that authorized a height increase at the 28-Acre Site from the existing 40 feet to 90 feet except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet. Proposition F conditioned the proposed height increase on completion of an EIR and approval of a development

[16] The Proposed Project would include market-rate and affordable residential uses, commercial use, retail, restaurant, and arts/light-industrial (which are collectively referred to for the purposes of this EIR as RALI uses).

plan for the 28-Acre Site by the Port Commission and Board of Supervisors. Proposition F did not address the Illinois Parcels. The area along Illinois Street had already been rezoned from 40-X to 65-X Height and Bulk District under the *Central Waterfront Plan*.

Building heights under the Proposed Project are inconsistent with the existing height limits on the project site. Upon certification of this EIR and the approval of a development plan for the 28-Acre Site by the Port Commission and Board of Supervisors, the legislative amendment to the existing Planning Code height and bulk limits within the project site adopted under Proposition F would become effective, and the existing 40-X Height and Bulk District within the inland portions of the 28-Acre Site would become 90-X (the existing height and bulk designation along a 100-foot-wide area along the shoreline would remain at 40-X). (See Figure 2.4: Existing and Proposed Height and Bulk Districts, in Chapter 2, Project Description, p. 2.16.) The existing 40-X Height and Bulk District of the eastern portion of the Hoedown Yard within the Illinois Parcels would be changed from 40-X to 65-X (the existing 65-X height and bulk designation within the rest of the Illinois Parcels would remain at 65-X).

THE ACCOUNTABLE PLANNING INITIATIVE

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added Section 101.1 to the Planning Code and established eight Priority Policies. Prior to issuing a permit for any demolition, conversion, or change of use, and prior to taking any action that requires a finding of consistency with the *General Plan*, the City is required to find that such project or action would be consistent with the following Priority Policies: (1) preservation and enhancement of neighborhood-serving retail uses and future opportunities for resident employment in and ownership of such businesses; (2) conservation and protection of existing housing and neighborhood character to preserve the cultural and economic diversity of neighborhoods; (3) preservation and enhancement of affordable housing; (4) discouragement of commuter automobiles that impede Muni transit service or that overburden streets or neighborhood parking; (5) protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership; (6) maximization of earthquake preparedness; (7) preservation of landmarks and historic buildings; and (8) protection of parks and open space and their access to sunlight and vistas.

PORT OF SAN FRANCISCO'S *WATERFRONT LAND USE PLAN*

As discussed in Chapter 3, Plans and Policies, on pp. 3.5-3.7, most of the project site (the 28-Acre Site and the 20th/Illinois Parcel) is owned by the Port of San Francisco and therefore is subject to

the Port of San Francisco's WLUP.[17] The WLUP was initially adopted by the Port Commission in 1997, revised in 2009, defining acceptable uses, policies, and land use information applicable to all properties under the Commission's jurisdiction. To the extent that the Proposed Project could be inconsistent with certain provisions of the existing WLUP, in order to approve the Proposed Project, the San Francisco Port Commission would need to approve amendments to the WLUP as necessary to ensure consistency between the Proposed Project and the amended WLUP. In 2014-2015, Port staff completed the comprehensive WLUP *1997-2014 Review Report* and have developed a public process for targeted updates to the WLUP. Draft updates to the WLUP are anticipated in the spring of 2017.

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

As discussed in Chapter 3, Plans and Policies, on p. 3.11, the San Francisco Bay Conservation and Development Commission (BCDC) has permit jurisdiction over areas of San Francisco Bay subject to tidal action up to the mean high tide line and including all sloughs, tidelands, submerged lands, and marshlands lying between the mean high tide and 5 feet above mean sea level, and the land lying between the Bay shoreline and a line drawn parallel to, and 100 feet from, the Bay shoreline, known as the 100-foot shoreline band. Under the McAteer-Petris Act, BCDC has permit authority for the placement of fill, extraction of materials, or substantial changes in use of land, water, or structures within its jurisdiction, and to enforce policies aimed at protecting the Bay and its shoreline, as well as maximizing feasible public access to the Bay. The Proposed Project would require approval of permits for activities within BCDC's jurisdiction within the Bay and along the Bay shoreline.

STATE LANDS COMMISSION, PUBLIC TRUST EXCHANGE

As discussed Chapter 3, Plans and Policies, pp. 3.16-3.17, certain formerly tidal and submerged portions of the 28-Acre Site are subject to the Public Trust Doctrine, a Common Law legal doctrine that governs the use of tidal and submerged lands, including former tidal and submerged lands that have been filled. The proposed placement of certain non-Public Trust (non-water-oriented) uses on land within the 28-Acre Site that is subject to the Public Trust would be inconsistent, on its face, with the Public Trust Doctrine. The Public Trust Doctrine provides that filled and unfilled tide and submerged lands are to be held in trust by the State for the benefit of the people of California. Pursuant to the Burton Act (Chapter 1333 of the Statutes of 1968), the Port of San Francisco has been granted administrative control over the public trust lands in the harbor of San Francisco for purposes of commerce, navigation, and fisheries. In order to resolve the Public Trust status of portions of Pier 70, the Port has obtained State legislation (Assembly

[17] City and County of San Francisco, Port of San Francisco, *Waterfront Land Use Plan*, Map of the Southern Waterfront Subarea, Revised Version, 2009, p. 163A.

Bill [AB] 418) that authorizes the State Lands Commission to approve a Public Trust exchange that would free some land from the Public Trust to allow non-trust uses within those areas, while committing other land to the Public Trust. The Proposed Project would require State Lands Commission approval of a Public Trust Exchange Agreement pursuant to California Public Resources Code Section 6307.

The State Lands Commission may not approve the exchange of the trust lands unless it finds all of the following:[18]

1. The portions of the trust lands or interests in lands to be exchanged out of the trust have been filled and reclaimed, are cut off from access to the waters of the San Francisco Bay, and are no longer in fact tidelands or navigable waterways, are relatively useless for Public Trust purposes, and constitute a relatively small portion of the granted lands within the City.
2. The lands or interests in lands to be impressed with the trust have a monetary value equal to or greater than the monetary value of the lands or interests in lands to be exchanged out of the trust. If the lands or interests in lands to be exchanged into the trust are insufficient to meet the requirement of equal or greater monetary value, the commission may consider a deposit of funds into the Land Bank Fund established pursuant to Section 8610 of the Public Resources Code to be held solely for acquisition of property, in an amount at least equal to the difference in value, for purposes of making the finding required by this paragraph.
3. No substantial interference with trust uses and purposes, including public rights of navigation and fishing, will ensue by virtue of the exchange.
4. The lands or interests in lands impressed with the trust will provide a significant benefit to the trust and are useful for the particular trust purposes authorized by this act.
5. The configuration of trust lands within the Pier 70 area, upon completion of the exchange, consists solely of lands suitable to be impressed with the trust.
6. The appropriate State agencies have approved an environmental site investigation and risk assessment of the Pier 70 area, and agree on subsequent actions and development standards needed to ensure appropriate management of potential risks through development of a risk management plan, a remedial action plan, or comparable regulatory documents specific to the conditions at the Pier 70 area; the Port has provided adequate financial assurances to ensure performance of any affirmative remedial actions required by any such plan or comparable regulatory document; and sufficient liability measures that protect the State will be in place upon completion of the exchange.
7. The final layout of streets in the Pier 70 area shall provide access to the trust lands and be consistent with the beneficial use of the trust lands.

[18] Assembly Bill 418, An act relating to tideland and submerged lands, Section 3, Approved by the Governor, October 05, 2011. Available online at http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120AB418. Accessed April 19, 2016.

8. Streets and other transportation facilities located on trust lands shall be designed to be compatible with the trust and to serve primarily trust purposes of access to shoreline improvements and shoreline circulation rather than serving non-trust purposes.
9. The San Francisco Port Commission and the City's Board of Supervisors have approved the exchange after at least one public hearing and have found, based on supporting documentation, that the lands or interests in lands impressed with the trust will provide a significant benefit to the trust and are useful for the trust purposes authorized by this act.
10. Any surveys or legal descriptions required for the parcels in conjunction with the exchange shall be approved by the commission or its executive officer.
11. The exchange otherwise complies with the requirements of this act.
12. The exchange is consistent with and furthers the purpose of the public trust, the Burton Act trust, and this act.
13. The exchange is otherwise in the best interest of the Statewide public.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on population and housing. Implementation of the Proposed Project would have a significant effect on population and housing if the project would:

B.1 Physically divide an established community;

B.2 Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

APPROACH TO ANALYSIS

A project that involves a change or intensification in land use would not be considered to have a significant impact related to the topic of Land Use and Land Use Planning unless the project would physically divide an established community.

Conflicts with existing plans and policies do not, in themselves, indicate a significant environmental effect related to the topic of Land Use and Land Use Planning within the meaning of CEQA, unless the project substantially conflicts with a land use plan/policy that was adopted for the purpose of avoiding or mitigating an environmental effect. The focus of the analysis under Impact LU-2 is on the Proposed Project's potential substantial conflicts with applicable

Land Use plans and policies. It does not present a comprehensive analysis of project conformity with applicable State, regional, and local plans and policies. Such analyses would be undertaken independent of the CEQA process, as part of the decision-makers' action to approve, modify, or disapprove the project or aspects thereof.

To the extent that physical environmental impacts may result from such conflicts, the EIR discloses and analyzes these physical impacts under the specific environmental topic sections in EIR Chapter 4, Environmental Setting and Impacts. Impacts resulting from a change or intensification of population and employment on the project site are discussed in Section 4.C, Population and Housing, and are also embodied in environmental impacts related to the capacity of existing facilities and services to adequately serve the area, such as those described in Transportation and Circulation, Recreation, Utilities and Service Systems, and Public Services. Physical impacts of construction and/or operation of the Proposed Project on the environment are embodied in physical impacts related to environmental topics such as Cultural Resources, Noise, Air Quality, Greenhouse Gas Emissions, Wind and Shadow, Hydrology and Water Quality, and Hazards and Hazardous Materials.

Project-level and cumulative land use impacts of the Proposed Project, for both the Maximum Residential Scenario and Maximum Commercial Scenario, are addressed in relation to the significance criteria.

PROJECT FEATURES

The Proposed Project would amend the *General Plan* and Planning Code, adding a new Pier 70 SUD. The Pier 70 SUD would establish land use zoning controls for the project site, and incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development* document. The proposed *Pier 70 SUD Design for Development* document sets forth the underlying vision and principles for development of the project site, and establishes standards and design guidelines to implement the intended vision and principles.

Mixed-Use Land Use Program

Development under the proposed SUD is intended to provide a balanced mixture of uses to support revitalization of the project site and reflect market conditions in the project site vicinity. To cover a full range of potential land uses that could be developed under the proposed SUD, this EIR analyzes both a Maximum Residential Scenario, which reflects the most-intensive residential use of the project site, and a Maximum Commercial Scenario, which reflects the most-intensive commercial use of the project site. The two scenarios bracket specific maximum ranges of uses that could be developed under the proposed SUD.

Maximum Residential Scenario

Development on the 28-Acre Site under the Maximum Residential Scenario would include a maximum of up to 3,410,830 gsf in new and renovated buildings. (See Table 2.3: Project Summary Table – Maximum Residential Scenario, and Figure 2.7: Proposed Land Use Plan – Maximum Residential Scenario, in Chapter 2, Project Description, p. 2.29 and p. 2.30, respectively.) Under this scenario, there would be up to 2,150 residential units totaling about 1,870,000 gsf, as well as approximately 1,095,650 gsf of commercial space and 445,180 gsf of RALI space (241,655 gsf of retail space; 60,415 gsf of restaurant space; and 143,110 gsf of arts/light-industrial space), in new and rehabilitated buildings. The mixed-use land use program includes two parcels, Parcels C1 and C2, that may be developed for parking, residential, or commercial use depending on future demand for parking and future travel patterns.

Development on the Illinois Parcels under the Maximum Residential Scenario would include a maximum of up to 801,400 gsf in newly constructed buildings (see Table 2.3). Under this scenario, there would be up to 875 residential units totaling about 760,000 gsf, as well as approximately 6,600 gsf of commercial area and approximately 34,800 gsf of retail/restaurant space (27,840 gsf of retail space and 6,960 gsf of restaurant space) in new buildings.

In total, there would be 3,025 total residential units, 83.9 percent more than in the Maximum Commercial Scenario. There would be 42.4 percent less of the commercial and RALI space.

Maximum Commercial Scenario

Development on the 28-Acre Site under the Maximum Commercial Scenario would include a maximum of up to about 3,422,265 gsf in new and renovated buildings. (See Table 2.4: Project Summary Table – Maximum Commercial Scenario, p. 2.31, and Figure 2.8: Proposed Land Use Plan – Maximum Commercial Scenario, p. 2.32.) Under this scenario, there would be up to 1,100 residential units totaling about 957,000 gsf, as well as approximately 2,024,050 gsf of commercial area, and 441,215 gsf of RALI space (238,485 gsf of retail space, 59,620 gsf of restaurant space, and 143,110 gsf of arts/light-industrial/PDR space), in new and rehabilitated buildings. The mixed-use land use program contemplates two parcels, Parcels C1 and C2, which may be developed for parking, residential, or commercial use depending on future demand for parking and future travel patterns.

Development on the Illinois Parcels under the Maximum Commercial Scenario would include a maximum of about 757,035 gsf in new buildings (see Table 2.4). Under this scenario, there would be up to 545 residential units totaling about 473,000 gsf, as well as approximately 238,300 gsf of commercial area and approximately 45,735 gsf of retail/restaurant space (36,590 gsf of retail space and 9,145 gsf of restaurant space) in new buildings.

In total, there would be 2,749,300 gsf of commercial and RALI space, 73.8 percent more than in the Maximum Residential Scenario. There would be 45.6 percent fewer residential units.

The use program totals of both scenarios are summarized in Table 4.B.1: Summary Totals under Maximum Residential and Maximum Commercial Scenarios, below.

Table 4.B.1: Summary Totals under Maximum Residential and Maximum Commercial Scenarios

Use	Maximum Residential Scenario Totals	Maximum Commercial Scenario Totals	Difference: Max. Res. Minus Max. Com.
Residential	2,630,000 gsf	1,430,000 gsf	1,200,000 gsf
No. of units	3,025 units	1,645 units	1,380 units
Commercial	1,102,250 gsf	2,262,350 gsf	(1,160,100) gsf
RALI	479,980 gsf	486,950 gsf	(6,970) gsf
Retail	269,495 gsf	275,075 gsf	(5,580) gsf
Restaurant	67,375 gsf	68,765 gsf	(1,390) gsf
Arts/Light-Industrial	143,110 gsf	143,110 gsf	0
Total	**4,212,230 gsf**	**4,179,300 gsf**	**(32,930) gsf**
Parking			
Off-Street	3,370 spaces	3,496 spaces	0
On-Street	285 spaces	285 spaces	0
Open Space	9 acres	9 acres	0

Sources: Forest City; Turnstone/SWCA

General Plan and Planning Code Amendments

The Proposed Project would amend the *General Plan* and Planning Code, adding a new Pier 70 SUD, which would establish land use zoning controls for the project site.

The Zoning Maps would be amended to show changes from the current zoning (M-2 [Heavy Industrial] and P [Public]) to the proposed SUD zoning.

Height limits on the 28-Acre Site would be increased to 90 feet, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet, as authorized by Proposition F (November 2014). The Planning Code text and height map amendments would also modify the existing height limits on an eastern portion of the Hoedown Yard from 40 feet to 65 feet. Height

limits are further restricted through the design standards established in the proposed *Pier 70 SUD Design for Development*.

Proposed Design Standards

Design Standards for New Construction

Proposed Design Standards are included as part of the proposed *Pier 70 SUD Design for Development.* Key standards (e.g., height, use, parking) will be incorporated into the proposed SUD. Future vertical development at the project site, whether constructed by Forest City, Forest City affiliates, or third-party developers selected by the Port and Forest City, would be bound by the Design Standards to inform building designs, subject to variants to the extent permitted under the SUD. The Port and Planning Department would use the proposed Design Standards to evaluate these future development proposals within the project site for compatibility with the SUD and the Union Iron Works Historic District.

Pedestrian Passageway Option

The Proposed Project would include a pedestrian passageway option under the Maximum Commercial Scenario. A Pedestrian Passageway Option is not applicable under the Maximum Residential Scenario since mid-block pedestrian passageways are not planned under that scenario. Both the Maximum Commercial Scenario and the Pedestrian Passageway Option would include a 40-foot-wide mid-block pedestrian passage that differentiates the southern parcels' (Parcels HDY1 and HDY2, Parcels F and G, and Parcels H1 and H2) building massing. However, the Pedestrian Passageway Option would require that an above-ground building connection over the passageways retain at least 60 percent exposure to the sky, whereas the Maximum Commercial Scenario would require a minimum setback of at least 10 feet with an additional setback of another 10 feet on the upper floor.

Proposed Open Space Plan

The Proposed Project would include 9 acres of publicly owned and accessible open space. (See Figure 2.15: Proposed Open Space Plan, p. 2.46.) The proposed open space would supplement recreational amenities in the vicinity of the project site, such as the future Crane Cove Park in the northwestern part of Pier 70, and would include extension of the Blue Greenway and Bay Trail through the southern half of the Pier 70 area. Open spaces programmed as part of the Proposed Project are the Waterfront Promenade, the Waterfront Terrace, Slipway Commons, the Building 12 Market Plaza and Market Square, the Irish Hill Playground, 20th Street Plaza, and, potentially, parking structure rooftops.

Proposed Traffic and Circulation Plan

As shown on Figure 2.16: Proposed Roadway Network, p. 2.50, the proposed primary streets on the project site would be 20th and 22nd streets, built out from west to east. The proposed Maryland Street would be a secondary north-south-running street and would be designed as a shared street. New minor streets proposed as part of the Proposed Project include a new 21st Street, running west to east from Illinois Street to the Waterfront, and Louisiana Street, running north from 22nd Street. A jog on Louisiana Street from 21st Street to 20th Street to accommodate existing historic structures within the 20th Street Historic Core would be provided. All proposed streets would include sidewalks, as well as street furniture.

Bicycle and Pedestrian Improvements

The Proposed Project would include bike lanes, bike-safety-oriented street design, and bike-parking facilities to promote bicycling in and around the project site. (See Figure 2.18: Proposed Bicycle Network, p. 2.54.) Under the provisions of the SUD, bike amenities would be constructed on the project site to meet or exceed Planning Code requirements. Improvements include construction of Class 2 facilities (bicycle lanes) and Class 3 facilities (shared-lane markings and signage) on 20th Street, 22nd Street, and Maryland Street. A Class 1 separated bicycle and pedestrian facility would be provided to extend the Bay Trail and Blue Greenway the length of the project site along the shoreline.

Pedestrian travel would be encouraged throughout the project site by establishing connected pedestrian pathways running both west to east and north to south to connect open spaces and by incorporating pedestrian-safe sidewalk and street design. All streets on the project site would have 9- to 18-foot-wide sidewalks. The project site is designed to make the area east of Maryland Street a predominantly pedestrian zone.

Parking

Parking spaces would be added to meet demand created by the Proposed Project, as well as to encourage more sustainable travel modes by limiting the number of on-site parking through implementation of a site-wide maximum and a maximum ratio per use. Under the Maximum Residential Scenario, up to 3,370 off-street parking spaces and up to 285 on-street parking spaces would be allowed. Under the Maximum Commercial Scenario, up to 3,496 off-street and 285 on-street parking spaces would be allowed.

New Off-Site 20th Street Pump Station

The Proposed Project includes the replacement of the existing 20th Street Pump Station, a necessary infrastructure improvement to accommodate future sewer and stormwater demands

from anticipated development on the project site. The approximately 15- by 30-foot structure, 10-foot-tall new pump station would be located on Port lands, likely immediately northeast of the project site boundary, adjacent to existing Building 6 on the BAE Systems Ship Repair site.

IMPACT EVALUATION

Impact LU-1: The Proposed Project would not physically divide an established community. ***(Less than Significant)***

The project site is characterized by clusters of structures set within large open areas. Vehicular access is limited, and is not integrated with the street grid of the Dogpatch neighborhood to the east. There is currently no public access to the waterfront and limited visual access to the Bay through the project site.

The Proposed Project, under both the Maximum Residential Scenario and the Maximum Commercial Scenario, would extend the City street grid through the project site, along the existing alignments of 20th and 22nd streets, and a new 21st Street access from Illinois Street through the project site to the waterfront. The proposed street plan also includes the future possibility of extending the proposed Maryland Street and proposed waterfront open space southward into the adjacent Potrero Power Plant site should a development plan for that site be proposed in the future.

The Proposed Project, under both the Maximum Residential Scenario and the Maximum Commercial Scenario, would create a network of public pedestrian and bike passages and interconnected public open spaces throughout the site, and create a link for the planned Bay Trail through the project site along the Bay shoreline. The proposed network of streets, pedestrian paths, bike paths, and open spaces is intended to enhance public access through the project site and to the waterfront and to integrate the project site into Dogpatch and the Central Waterfront neighborhoods.

Similarly, the Proposed Project would enhance public access to the Bay along the existing alignments of 20th and 22nd streets, and would create new view corridors to the Bay along the proposed 21st Street as well as through the proposed Market Square/Slipways Commons public open spaces. In addition, new opportunities for the public to access the shoreline and view the Bay from the proposed Waterfront Promenade and Waterfront Terrace public open spaces would be created.

For these reasons, the Proposed Project would have a less-than-significant land use effect related to physical division of a community. No mitigation measures are necessary.

Impact LU-2: The Proposed Project would not conflict with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect, such that a substantial adverse physical change in the environment related to Land Use would result. *(Less than Significant)*

General Plan and Planning Code Use Districts

Maximum Residential Scenario

As discussed in Chapter 3, Plans and Policies, the proposed residential and commercial uses under the Maximum Residential Scenario are not consistent with current land use plans and policies under the *San Francisco General Plan,* and the Planning Code M-2 (Heavy Industrial) and P (Public) Use Districts. However, the *General Plan* – and in particular, the *Central Waterfront Area Plan* in which the project site is located – is a high-level planning document that supports higher-density, mixed-use, transit-oriented development such as the Proposed Project.

Maximum Commercial Scenario

Similar to the Maximum Residential Scenario, the proposed residential and commercial uses under the Maximum Commercial Scenario are not consistent with current land use plans and policies under the *San Francisco General Plan,* and the Planning Code M-2 (Heavy Industrial) and P (Public) Use Districts. However, as noted above, the *General Plan* – and in particular, the *Central Waterfront Area Plan* in which the project site is located – is a high-level planning document that supports higher-density, mixed-use, transit-oriented development such as the Proposed Project.

Conclusion

If the Board of Supervisors finds that amendments to the *General Plan* and Planning Code are warranted to allow for implementation of the Proposed Project, under both the Maximum Residential Scenario and the Maximum Commercial Scenario, the Board of Supervisors would adopt amendments to the *General Plan* and Planning Code to establish the Pier 70 SUD. Conflicts between the *General Plan* and Planning Code, and the Proposed Project would be resolved through legislative amendment of the *General Plan* and Planning Code.

Conflicts with existing plans and policies do not, in themselves, indicate a significant environmental effect related to the topic of Land Use and Land Use Planning within the meaning of CEQA, unless the project substantially conflicts with a land use plan/policy that was adopted for the purpose of avoiding or mitigating an environmental effect, such that a substantial adverse physical change in the environment related to Land Use would result. As discussed above under "Approach to Analysis," on pp. 4.B.17-4.B.18, to the extent that physical environmental impacts

may result from such conflicts, the EIR discloses and analyzes these physical impacts under the specific environmental topic sections in EIR Chapter 4, Environmental Setting and Impacts.

The Proposed Project, including both the Maximum Residential Scenario and the Maximum Commercial Scenario, would not conflict with land uses plans and policies such that a substantial adverse physical change in the environment related to Land Use would result. For this reason, the Proposed Project would have a less-than-significant land use effect related to conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No mitigation measures are required. Potential conflicts with applicable *General Plan* objectives and policies will continue to be analyzed and considered as part of the review of entitlements applications required for the Proposed Project independent of environmental review under CEQA. They also will be considered by the decision-makers during their deliberations on the merits of the Proposed Project and as part of their actions to approve, modify, or disapprove the Proposed Project.

New 20th Street Pump Station

The proposed new 20th Street pump station would be located northeast of the project site boundary, adjacent to existing Building 6 on the BAE Systems Ship Repair site. The BAE Systems Ship Repair site is zoned M-2 (Heavy Industrial), and development of the new pump station, including related infrastructure improvements needed for operation of the new pump station, would be consistent with permitted uses of the existing zoning on the site. Construction of the new pump station would not conflict with land used plans and policies such that a substantial adverse physical change in the environment related to Land Use would result. The proposed pump station would have a less-than-significant land use effect related to conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and no mitigation measures are required.

Port of San Francisco Waterfront Land Use Plan

Maximum Residential Scenario

As discussed in Chapter 3, Plans and Policies, the proposed residential and commercial uses under the Maximum Residential Scenario are not consistent with current land use plans and policies under the Port of San Francisco's WLUP.

Maximum Commercial Scenario

Similar to the Maximum Residential Scenario, the proposed residential and commercial uses under the Maximum Commercial Scenario are not consistent with current land use plans and policies under Port of San Francisco's WLUP.

Conclusion

If the San Francisco Port Commission finds that amendments to its WLUP are warranted to allow for implementation of the vision for the project site embodied by the Proposed Project, the Port Commission would adopt amendments to resolve the conflicts with the WLUP. Accordingly, conflicts between the WLUP and the Proposed Project would be resolved through amendment of the WLUP.

Conflicts with existing plans and policies do not, in themselves, indicate a significant environmental effect related to the topic of Land Use and Land Use Planning within the meaning of CEQA, unless the project substantially conflicts with a land use plan/policy that was adopted for the purpose of avoiding or mitigating an environmental effect. As discussed above under "Approach to Analysis," on pp. 4.B.17-4.B.18, to the extent that physical environmental impacts may result from such conflicts, the EIR discloses and analyzes these physical impacts under the specific environmental topic sections in EIR Chapter 4, Environmental Setting and Impacts.

The Proposed Project, including both the Maximum Residential Scenario and the Maximum Commercial Scenario, would not conflict with land used plans and policies such that a substantial adverse physical change in the environment related to Land Use would result. For this reason, the Proposed Project would have a less-than-significant land use effect related to conflicts with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No mitigation measures are required. Potential conflicts with applicable objectives and policies of the Port of San Francisco WLUP will be considered as part of the review of entitlements applications required for the Proposed Project independent of environmental review under CEQA. They also will be considered by the decision-makers during their deliberations on the merits of the Proposed Project and as part of their actions to approve, modify, or disapprove the Proposed Project.

San Francisco Bay Conservation and Development Commission *Bay Plan*

As discussed in Chapter 3, Plans and Policies, BCDC's jurisdiction includes the Bay and areas within 100 feet inland of the mean high tide line. The Proposed Project would require BCDC approval of activities within BCDC's jurisdiction along the Bay shoreline. BCDC will make the final determination of consistency with *Bay Plan* policies for the portions of the project site that are within its permit jurisdiction.

Proposed Public Trust Exchange

As discussed above under Regulatory Framework on pp. 4.B.15-4.B.17, the proposed placement of certain non-Public Trust (non-water-oriented) uses on land within the 28-Acre Site that is

subject to the Public Trust would be inconsistent, on its face, with the Public Trust Doctrine. To resolve the Public Trust status of portions of Pier 70, the Port has obtained State legislation (AB 418) that authorizes the State Lands Commission to approve a Public Trust exchange that would free some land from the Public Trust to allow non-trust uses within those areas, while committing other land to the Public Trust. The Proposed Project would require State Lands Commission approval of a Public Trust Exchange Agreement. Under AB 418 the State Lands Commission may not approve the exchange of the trust lands unless it finds that the proposed exchange would meet specified requirements, presented above on pp. 4.B.16-4.B.17, to ensure consistency with the purposes of the Public Trust. Conformity with the specified conditions of AB 418 would ensure that the Proposed Project would be consistent with the Public Trust Doctrine.

Conclusion

The Proposed Project would have a less-than-significant Land Use effect related to conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No mitigation measures are required. Potential conflicts with applicable *General Plan*, WLUP, and *Bay Plan* objectives and policies will continue to be analyzed and considered as part of the review of entitlement applications required for the Proposed Project independent of environmental review under CEQA. They also will be considered by the decision-makers during their deliberations on the merits of the Proposed Project and as part of their actions to approve, modify, or disapprove the Proposed Project.

CUMULATIVE IMPACTS

Impact C-LU-1: The Proposed Project, in combination with past, present, or reasonably foreseeable future projects, would not contribute considerably to significant cumulative land use impacts related to (a) physical division of an established community, or (b) conflicts with applicable land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect. *(Less than Significant)*

Section 4.A, Introduction to Chapter 4, on pp. 4.A.12-4.A.17, identifies several foreseeable future projects that are located within an approximately 0.5-mile radius of the project site. In addition, as discussed on pp. 4.A.17-4.A.18, several area plans have identified the southeastern part of San Francisco as the location for substantial future growth in housing and employment. The Proposed Project would contribute to these changes in land use and extend these changes farther south and east. Residential and commercial densities under the Proposed Project would exceed those of the existing Dogpatch neighborhood but would be comparable to anticipated and planned development in the Dogpatch neighborhood area and to the existing and planned development in nearby Mission Bay.

As discussed above under Impact LU-1, the Proposed Project, under both the Maximum Residential Scenario and Maximum Commercial Scenario, would extend a network of public streets, pedestrian paths, and open spaces to facilitate public access through the project site and to the waterfront. Therefore, the Proposed Project, including both the Maximum Residential Scenario and the Maximum Commercial Scenario, would not contribute to the physical division of an established community.

The Proposed Project's conflict with existing land use plans and policies, discussed above under Impact LU-2, would not result in a cumulatively considerable contribution to an environmental impact related to Land Use. Both the Maximum Residential Scenario and Maximum Commercial Scenario would constitute a substantial increase in population and employment in the project vicinity beyond what has been previously anticipated under various area plans for the southeastern part of the City. The project site is within one of several Priority Development Areas in San Francisco that the Association of Bay Area Governments and the City have identified to accommodate anticipated population growth. Additionally, as noted above, the *General Plan* – and in particular, the *Central Waterfront Area Plan* in which the project site is located – supports higher-density, mixed-use, transit-oriented development such as the Proposed Project.

The Proposed Project, together with other projects and area plans in the vicinity, would advance several City and regional land use policy objectives such as increasing housing development areas to help the City meet its regional housing needs targets; creating a sustainable and more efficient land use pattern by concentrating and redirecting land uses into higher density, mixed-use projects near transit with access to Downtown and neighborhood retail and services; reducing the negative land use effects of automobile traffic and parking in the area and creating more livable and safe street environments for pedestrians and bicyclists; and reducing greenhouse gas emissions. Therefore, potential unanticipated population and employment growth, under both the Maximum Residential Scenario and Maximum Commercial Scenario, would not make a cumulatively considerable contribution to a significant cumulative impact related to land use resulting from a conflict with existing land use plans and policies.

For these reasons, the Proposed Project, under both the Maximum Residential Scenario and Maximum Commercial Scenario, in combination with past, present, and reasonably foreseeable future projects, would have less-than-significant cumulative land use impacts. The Proposed Project would not make a cumulatively considerable contribution to a significant cumulative land use impact, and no mitigation measures are necessary.

C. POPULATION AND HOUSING

Section 4.C, Population and Housing, examines the effects of the Proposed Project related to population, housing, and employment. The Environmental Setting discussion describes existing regional and Citywide population, housing, and employment conditions and trends, and existing population and employment characteristics on the project site. The Regulatory Framework describes regional and local plans and regulations related to population and housing. The Impacts and Mitigation Measures discussion addresses potential population, housing, and employment effects that would result from implementation of the Proposed Project, and potential mitigation measures to lessen any impacts. Both project-level and cumulative environmental impacts are evaluated. Project construction is anticipated to commence in 2018 and would be phased over an approximately 11-year period, concluding in 2029. The timeframe for existing conditions used in this analysis is 2010 and 2013 (years with the most up-to-date population and housing data as of May 6, 2015, the Notice of Preparation publication date) and 2040 for projected future project conditions.

The information in this section is based on the land use program for the Proposed Project; the 2010 U.S. Census data for the City and County of San Francisco and Census Tract 226; the 2009-2013 5-Year American Community Survey (2013 ACS); Association of Bay Area Governments (ABAG) *Projections 2013*;[1] ABAG's *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*;[2] the 2014 Housing Element of the *San Francisco General Plan (General Plan)*; and the *2014 San Francisco Housing Inventory*.[3]

[1] ABAG is the regional agency responsible for preparing forecasts of population, housing, and employment growth in the nine Bay Area counties and their cities. ABAG's 2013 edition (*Projections 2013*) of its biennial forecast of population, housing, jobs, and income for the nine-county San Francisco Bay Region was released in July 2013.

[2] ABAG, *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*, July 18, 2013. Available online at http://www.abag.ca.gov/planning/housingneeds/pdfs/2014-22_RHNA_Plan.pdf. Accessed September 10, 2015.

[3] San Francisco Planning Department, *San Francisco General Plan*, Housing Element, Part I: Data and Needs Analysis, April 2015 (hereinafter referred to as "Data and Needs Analysis"). Available online at http://www.sf-planning.org/ftp/general_plan/2014HousingElement-AllParts_ADOPTED_web.pdf. Accessed September 11, 2015.

ENVIRONMENTAL SETTING

CITY AND REGIONAL POPULATION GROWTH TRENDS

Population

As shown in Table 4.C.1: City and County of San Francisco Population Growth Trends, San Francisco's population grew over the 40-year period between 1970 and 2010, increasing by approximately 12.5 percent. Between 1970 and 1980, San Francisco experienced a period of decline in population; however, between 1980 and 2000 the City's population increased, returning to and exceeding the1970 population. Between 2000 and 2010, the rate of population growth decreased by half from the previous decade (from 7.3 percent in 2000 to 3.7 percent in 2010) as a result of the recession and subsequent sluggish economic growth. As of 2010, San Francisco is ranked as the second most populous city in the nine-county San Francisco Bay Area (Bay Area),[4] behind San Jose, and is the most urbanized county in the Bay Area, with more than 90 percent of its land developed.[5] The U.S. Census Bureau's 2013 ACS estimates that the City's total population has steadily increased since 2010, to 817,501.[6] According to ABAG *Projections 2013*, the population is expected to increase steadily through the year 2040.

Table 4.C.1: City and County of San Francisco Population Growth Trends

Year	Population	10-Year Percent Increase
1970	715,674	-
1980	678,974	-5.1%
1990	723,959	6.6%
2000	776,733	7.3%
2010	805,235	3.7%
2020	890,400	10.6%*
2030	981,800	10.3%*
2040	1,085,700	10.6%*

Note:
* = projected population growth

Sources: U.S. Census, 2015 (1970-2010); ABAG, *Projections 2013* (2020-2040)

[4] The Bay Area's nine counties are Sonoma, Napa, Solano, Marin, Contra Costa, San Francisco, Alameda, San Mateo, and Santa Clara.

[5] Bay Area Census, Ten Largest Bay Area Cities by 2010 Ranking, 1960-2010. Available online at http://www.bayareacensus.ca.gov/historical/largecity.htm. Accessed September 4, 2015.

[6] U.S. Census Bureau, 2009-2013 5-Year American Community Survey, San Francisco County, American Community Survey Demographic and Housing Estimates. Available online at http://factfinder.census.gov/rest/dnldController/deliver?_ts=461008993623. Accessed September 22, 2015.

The City's population is projected to increase by 10.6 percent between 2010 and 2020; by 10.3 percent between 2020 and 2030; and by 10.6 percent between 2030 and 2040. Overall, ABAG projects the City's population will increase by 34.8 percent over the 30-year period between 2010 and 2040.[7] Average annual growth rates under such projections would be approximately 1.2 percent.

The population of the Bay Area is expected to increase at a slightly lower rate than San Francisco's population over the same 30-year period. The Bay Area's population is estimated to increase by approximately 8.8 percent between 2010 and 2020, by 9.1 percent between 2020 and 2030, and by 9.4 percent between 2030 and 2040.[8] Overall, the Bay Area's population is expected to increase by 29.1 percent over this 30-year period. Average annual growth rates under such projections would be approximately 0.97 percent, approximately 0.23 percent lower than the San Francisco growth rate.

Housing

The following section describes the housing characteristics of San Francisco and the Bay Area. Currently, there are no housing units or residential populations on the project site.

Households

In 2010, San Francisco had 345,811 households (defined by ABAG as an occupied residential unit), comprising approximately 13.2 percent of Bay Area households (see Table 4.C.2: Population and Household Projections for San Francisco and the Bay Area, 2010-2040). By 2040, ABAG estimates the number of San Francisco households will increase by 29.4 percent to 447,350 households and represent approximately 13.5 percent of Bay Area households. In 2010, the Bay Area had 2,608,023 households, and by 2040, ABAG estimates the number of Bay Area households will increase by approximately 26.8 percent to 3,308,090 households.[9]

According to the U.S Census, the average household size in San Francisco has fluctuated between 2.30 persons per household in 2000 to 2.26 persons per household in 2010, which is smaller than the Bay Area average household size of 2.69 persons per household.[10] According to ABAG *Projections 2013,* San Francisco's average household size is projected to increase slightly to 2.27 persons per household in 2015 and to 2.35 persons per household by 2040.[11] The Bay Area

[7] ABAG, *Projections 2013,* p. 75.
[8] ABAG, *Projections 2013,* p. 20.
[9] ABAG, *Projections 2013,* pp. 20-21 and p. 75.
[10] U.S. Census Bureau, 2000 Census and 2010 Census, Profile of General Demographic Characteristics: 2000 and Profile of General Population and Housing Characteristics: 2010; and ABAG, *Projections 2013*, p. 74.
[11] ABAG, *Projections 2013,* p. 74.

average household size is expected to increase from 2.69 to 2.75 persons per household between 2015 and 2040.[12]

Table 4.C.2: Population and Household Projections for San Francisco and the Bay Area, 2010-2040

	San Francisco		Bay Area	
Year	**Population**	**Households**	**Population**	**Households**
2010	805,235	345,811	7,150,739	2,608,023
2015	847,000	362,440	7,461,400	2,720,410
2020	890,400	379,600	7,786,800	2,837,680
2025	934,800	396,000	8,134,000	2,952,910
2030	981,800	413,370	8,496,800	3,072,920
2035	1,032,500	430,070	8,889,000	3,188,330
2040	1,085,700	447,350	9,299,100	3,308,090

Source: ABAG, *Projections 2013*

Housing Density

Housing density is measured as the average number of units per acre. According to the *General Plan's* 2014 Housing Element, overall housing density in San Francisco ranges from low (14 units per acre), moderately low (36 units per acre), medium (54 units per acre), moderately high (91 units per acre), to high (283 units per acre). The project site is located in an area that has zoning parameters that permit average housing density of 54 units per acre.[13]

Existing Housing Stock

According to the 2013 ACS, San Francisco has 378,186 housing units, of which 32,842 are vacant, resulting in an approximately 8.7 percent total vacancy rate. However, the 2013 ACS estimates a much lower total vacancy rate, with a homeowner vacancy rate of approximately 1.2 percent and a rental vacancy rate of approximately 3.7 percent.[14] According to the *General Plan's* 2014 Housing Element, differences between total vacancy rate and the sum of the

[12] ABAG, *Projections 2013*, p. 19.
[13] San Francisco Planning Department, Data and Needs Analysis, Map 6, Generalized Permitted Housing Densities by Zoning Districts, San Francisco, 2013.
[14] U.S. Census Bureau, 2009-2013 5-Year American Community Survey 5-Year Estimates, San Francisco County, Selected Housing Characteristics. Available online at http://factfinder.census.gov/rest/dnldController/deliver?_ts=461008993623. Accessed September 22, 2015.

homeowner and rental vacancy rates may be attributable to sampling error and an increase in time-shares and corporate homes used for employee housing.[15]

According to the 2013 ACS, most of San Francisco's housing stock is composed of multi-unit structures (approximately 67.7 percent), with a smaller percentage of single-family homes (approximately 32.1 percent).[16] This breakdown is in accord with information in the San Francisco Planning Department's *2014 Housing Inventory*, i.e., low-density buildings (single-family homes – 33 percent), moderate density buildings (two to nine units – 31 percent), and higher density structures (10 or more units – 36 percent).[17]

In 2014, the City's housing stock was augmented by 3,514 net new units, of which approximately 21 percent were affordable units. The 2014 net new unit production represents an increase of 79 percent over 2013's net new unit production (1,960 net new housing units).[18] It also exceeded the 10-year average of 2,075 net new units and represents a continuing upward trend in net new unit production from the lowest production point, 2011 (269 units).[19] In 2014, the Department of Building Inspection authorized the construction of 3,834 new housing units, which represents a 21 percent increase over the number of units authorized in 2013.[20] The *2014 Housing Inventory* indicates that the majority of new housing units developed since 2010 have been in multi-unit developments, with a significant percentage of these (90 percent) in developments with 20 or more units.[21]

Housing Needs

Over the course of the past several decades, the construction of housing has failed to keep pace with population growth in the Bay Area. Although population growth has slowed and is predicted to continue at a relatively moderate rate through 2040, the region is still attempting to make up for housing shortages from previous growth periods. The lack of local housing options that are affordable causes many Bay Area residents to seek housing outside of the nine-county

[15] San Francisco Planning Department, Data and Needs Analysis, pp. I.36-I.37.
[16] U.S. Census Bureau, 2009-2013 5-Year American Community Survey, San Francisco County, Selected Housing Characteristics. Available online at http://factfinder.census.gov/rest/dnldController/deliver?_ts=461008993623. Accessed September 22, 2015.
[17] San Francisco Planning Department, *2014 San Francisco Housing Inventory*, April 2015 (hereinafter referred to as "*San Francisco Housing Inventory*"), Table 1, p. 16. Available online at http://www.sf-planning.org/ftp/files/publications_reports/2014_Housing_Inventory.pdf. Accessed September 4, 2015.
[18] Annual net housing unit change is the sum of units completed from new construction and alterations minus units lost from demolition and alterations.
[19] San Francisco Planning Department, *San Francisco Housing Inventory*, pp. 16-18.
[20] San Francisco Planning Department, *San Francisco Housing Inventory*, pp. 16-17.
[21] San Francisco Planning Department, *San Francisco Housing Inventory*, pp. 16-17.

Bay Area, resulting in long commutes and significant impacts on the regional transportation system.

This housing shortage is compounded in San Francisco by additional factors. San Francisco was historically developed as an employment center, which means that there are more jobs than housing units in the City. In addition, San Francisco is relatively built up, with limited land available for development. Policy 1.9 of the Housing Element of the *General Plan* requires that new commercial developments and higher educational institutions (also known as post-secondary educational institutions)[22] that increase the City's employment base or student population must meet the housing demand they generate, with particular emphasis on affordable housing or paying in-lieu fees into the City's Jobs-Housing Linkage Program.[23]

In 2014, the median price for a two-bedroom home in San Francisco rose to $798,910, 12 percent more than the median price in 2013 ($714,840). Median rental prices in 2014 for a two-bedroom apartment in San Francisco increased by almost 40 percent to $4,580 per month, up from $3,300 in 2013. The Bay Area remains one of the nation's most expensive housing markets.[24]

In order to respond to Statewide population and household growth, and to ensure the availability of decent affordable housing for all income groups, in 1981 the State enacted Government Code Section 65584, which requires each Council of Governments[25] to periodically distribute State-identified housing needs to all jurisdictions within its region. ABAG serves as the Council of Governments for the Bay Area. Government Code Section 65584 requires ABAG and other Council of Governments to periodically update the Regional Housing Needs Assessment. On July 18, 2013, the ABAG Executive Board adopted the *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*, which identifies the San Francisco Bay Area's housing need determination for the 2014-2022 planning period.

The ABAG Policy Board established housing needs for all jurisdictions within its boundaries for the 2014-2022 planning period by using a "fair share" approach, based on projected household and job growth of the region as well as regional income level percentages. Each jurisdiction is required by State law to incorporate its housing need numbers into an updated version of its *General Plan* Housing Element. The City's *General Plan* Housing Element was approved by the Department of Housing and Community Development on May 29, 2015. The Bay Area's overall

[22] A higher educational institution is a public or private institution that provides educational services and can include universities, colleges, seminaries, academies, and institutes of technology.
[23] San Francisco Planning Department, *San Francisco General Plan*, Housing Element, Part II: Objectives & Policies, April 2015.
[24] San Francisco Planning Department, *San Francisco Housing Inventory*, p. 34.
[25] A Council of Governments is a single or multi-county council created by a joint powers agreement that partakes in regional planning. ABAG is the Council of Governments for the San Francisco Bay Area.

projected housing need over the defined planning period is approximately 187,990 new residential units. San Francisco's share of this number is about 28,869 units, or an average of approximately 3,609 units per year.[26]

Government Code Section 65584 also requires that a city's share of regional housing needs include housing needs of persons at all income levels. The different income levels to be studied within the parameters of State-mandated local Housing Elements, which must be prepared by every city and county in California, are "Very Low Income," "Low Income," "Moderate Income," and "Above Moderate Income." The City's distribution of housing needs across income levels is presented in Table 4.C.3: Existing San Francisco Household Income Distribution and Housing Needs.

Table 4.C.3: Existing San Francisco Household Income Distribution and Housing Needs

Income Group	Income Level	Income Range[1]	Percentage of S.F. Households	S.F. Housing Need[2]
Very Low	≤50% of AMI	$23,300-$26,200	27.9%	6,234 units
Low	51%–80% of AMI	$55,175-$62,075	14.8%	4,639 units
Moderate	81%–120% of AMI	$81,575-$91,775	18.8%	5,460 units
Above Moderate	>120% of AMI	>$112,675	38.5%	12,536 units
Total			100.0%	28,869 units

Notes:

AMI – Area Median Income (The 2012 ACS estimated an AMI of approximately $73,802.)

[1] San Francisco Planning Department, *San Francisco General Plan*, Housing Element, Part I: Data and Needs Analysis, April 2015, Table I-39: Household Income Standards by Household Size, 2014, and Table I-40: Income Distribution, San Francisco, 2012, p. 42. The income range shown above is the average income range for two- to three-person households in the City.

[2] San Francisco Planning Department, *San Francisco General Plan*, Housing Element, Part I: Data and Needs Analysis, April 2015, Table I-38, p. 41.

Source: San Francisco Planning Department, *San Francisco General Plan*, Housing Element, Part I: Data and Needs Analysis, April 2015

Between 2004 and 2013, 19,316 net new housing units were added Citywide, with an annual average during this 10-year period of about 1,932 units per year. In comparison, a net total of 13,634 housing units were added between 1994 and 2003, or an annual rate of about 1,363 units per year. Most of the new construction in the last 10 years has occurred in larger structures, with 91 percent of the housing developed in buildings with more than 10 units.

[26] ABAG, *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*, Appendix A, Attachment 1 and Appendix C, pdf pp. 21 and 28.

In 2014, Citywide net new housing stock increased by 3,514 units.[27] To meet current regional housing need projections, the City would need to increase housing unit production to an average of approximately 3,609 units per year. Thus, although the annual rate of housing production has steadily increased, particularly in the past few years, San Francisco remains slightly behind in meeting its share of the regional housing needs allocation forecast for the 2014-2022 planning period.

The South of Market (SOMA) Planning District, which includes the project site, absorbed most of the new housing development between 2010 and 2013, accounting for about 1,230 new units, or almost 35.3 percent of all new housing during that period. The Downtown and Western Addition Planning Districts followed with roughly 729 and 424 new units, respectively, together accounting for about 33 percent of new housing.[28] In 2014 the construction of new housing in the SOMA Planning District more than doubled compared to the previous four years, with 1,892 net new units, or 54 percent of net new additions to the City.[29] Of the new housing stock in this district, 73.8 percent was in developments with 10 or more units.[30]

Employment

San Francisco is a primary employment hub for the Bay Area and contains regional employment centers and major transportation thoroughfares. Two types of employment data are described below: total jobs within San Francisco and employed residents, i.e., the number of residents of working age who actively participate in the civilian labor force. The civilian labor force includes those who are employed (except in the armed forces) and those who are unemployed but actively seeking employment. Those who have never held a job, who have stopped looking for work, or who have been unemployed for a long period of time are not considered to be in the labor force.

Total Jobs

According to ABAG *Projections 2013*, San Francisco had about 617,420 jobs in 2015.[31] The City is projected to have a total of approximately 671,230 jobs by 2020, approximately 707,670 jobs by 2030, and approximately 759,500 jobs by 2040, resulting in an approximately 23 percent increase (142,080 total jobs) over the 25-year period.[32] Between 2015 and 2040, the total number of jobs in the nine-county Bay Area is expected to increase by almost 835,240 jobs, a 22.8 percent increase. During this period, San Francisco's share of regional employment is

[27] San Francisco Planning Department, *San Francisco Housing Inventory*, p. 37.
[28] San Francisco Planning Department, Data and Needs Analysis, p. I.26.
[29] San Francisco Planning Department, *San Francisco Housing Inventory*, p. 36.
[30] San Francisco Planning Department, *San Francisco Housing Inventory*, p. 40.
[31] ABAG, *Projections 2013*, p. 22.
[32] ABAG, *Projections 2013*, p. 75.

expected to increase slightly, from 16.8 percent in 2015 to 16.9 percent in 2040.[33] As of 2010, commuters into San Francisco held 27.3 percent of the jobs in San Francisco. The share of San Francisco jobs held by residents from other Bay Area counties is expected to increase as compared to 2010 to approximately 43 percent by 2020, 40 percent by 2030, and 42 percent by 2040.[34] As a regional job center, San Francisco will continue to have a larger share of commuters than other cities in the Bay Area.

Employed Residents

According to ABAG *Projections 2013,* San Francisco had approximately 460,450 employed residents in 2015.[35] This number is expected to increase to approximately 501,470 employed residents by 2020, approximately 530,200 by 2030, and approximately 571,580 by 2040, resulting in an approximately 12 percent increase (111,130 employed residents) over the 25-year period.[36] According to 2013 ACS data, about 76 percent of San Francisco's employed residents work in San Francisco, while about 24 percent commute to jobs outside of San Francisco.[37] Assuming the same percentages, in 2040 about 137,179 (24 percent) of San Francisco's employed residents would continue to commute to jobs outside of San Francisco, and about 434,400 (76 percent) of San Francisco's employed residents would live and work in San Francisco. The City and County of San Francisco had an unemployment rate of 3.3 percent in September 2015, down 0.8 percent from September 2014.[38]

Project Area Population and Employment

The project site is located within Census Tract 226, which comprises most of the Central Waterfront Planning Area. Census Tract 226 is bounded by 16th Street to the north, I-280 to the west, 25th Street to the south, and San Francisco Bay to the east. According to the 2010 U.S. Census, Census Tract 226 had a total population of 1,534 residents.[39] Between the 2000 and

[33] ABAG, *Projections 2013,* p. 22.
[34] San Francisco Planning Department, Data and Needs Analysis, p. I.14.
[35] ABAG, *Projections 2013,* p. 74.
[36] ABAG, *Projections 2013,* p. 74.
[37] U.S. Census Bureau, 2009-2013 5-Year American Community Survey, San Francisco County, Commuting Characteristics by Sex. Available online at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_S0801&prodType=table. Accessed September 25, 2015.
[38] State of California Employment Development Department, Historical Civilian Labor Force, San Francisco County, September 2015. Available online at http://www.labormarketinfo.edd.ca.gov/data/unemployment-and-labor-force.html. Accessed December 9, 2016.
[39] U.S. Census Bureau, *Community Facts*: *Population, Housing Units, and Density: 2010 – County – Census Tract.* Available online at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF. Accessed September 8, 2015.

2010 U.S. Census, the population of Census Tract 226 increased by 688 residents,[40] which represents an approximately 81.3 percent increase in the population of 846 persons recorded for the census tract in the 2000 U.S. Census.[41] Currently, there are no residential units on the project site, and existing on-site employment consists of about 60 to 70 workers.[42]

REGULATORY FRAMEWORK

REGIONAL

Plan Bay Area

Plan Bay Area is a long-range (2040) integrated transportation and land use/housing strategy for the San Francisco Bay Area. *Plan Bay Area* marks the nine-county region's first long-range plan to meet the requirements of California's 2008 Senate Bill 375 (SB 375), which calls on each of the State's 18 metropolitan areas to develop a Sustainable Communities Strategy, an integrated transportation, land use, and housing plan that addresses ways to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks. *Plan Bay Area* advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy. ABAG and the Metropolitan Transportation Commission jointly approved *Plan Bay Area* on July 18, 2013.

Since 2002, the regional population, household, and job forecast has been "policy-based," meaning that the forecast promotes policy objectives which increase housing development and alternative transportation modes, specifically by increasing the proportion of growth near transit and in existing urban areas. With the adoption of SB 375 and its requirement that regional planning agencies create a plan to meet targets for greenhouse gas emissions reduction tied to land use, the Bay Area can expect to see further development directed towards existing urban areas like San Francisco to increase housing near jobs, reduce urban sprawl, and reduce greenhouse gas emissions. These areas have been identified as priority development areas (PDAs). A PDA is an infill location of at least 100 acres served by transit that is designated for compact land development, along with investments in community improvements and infrastructure. Under *Plan Bay Area*, 78 percent of new housing and 62 percent of new jobs in the Bay Area will be concentrated in PDAs. The project site is located within the Port of San

[40] U.S. Census Bureau, *Community Facts*: *Population, Housing Units, and Density: 2000 – County – Census Tract.* Available at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF. Accessed September 8, 2015.

[41] U.S. Census Bureau, *Community Facts*: *Population, Housing Units, and Density: 2000 – County – Census Tract*. Available at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF. Accessed September 8, 2015.

[42] Brad Benson, Port of San Francisco, email communication, January 8, 2015.

Francisco PDA, which includes approximately 678 acres of public waterfront lands and stretches 7.5 miles from Fisherman's Wharf to India Basin, adjacent to Hunters Point Shipyard in the Bayview/Hunters Point community. The Port of San Francisco PDA is one of 12 PDAs in the City where 88 percent of population growth in the City is expected to take place.[43] The Port of San Francisco PDA forecasts a population of 3,059 residents, 1,497 households, and 149,684 jobs by 2040.[44]

Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022

The California Department of Housing and Community Development (HCD) is responsible for determining the overall regional housing need for the State and for initiating the process by which each Council of Governments, in this case ABAG, then distributes its share of regional housing need to all jurisdictions within its region. Government Code Section 65584 requires periodic development of a new Regional Housing Needs Assessment. In July 2013, ABAG released its *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*, which identifies the Bay Area's housing needs determination for the 2014-2022 planning period, as described above under "Housing Needs" on pp. 4.C.5-4.C.8.

Since 1980, the State of California has required each jurisdiction to plan for its share of the State's housing need for people of all income levels (California Government Code Section 65580). The Regional Housing Need Allocation (RHNA) process is a State mandate designed to address each jurisdiction's assigned share of the Statewide housing need for an eight-year planning period. The RHNA process requires the HCD to determine the total housing need for each region in the State, and each region's Council of Governments (e.g., ABAG for the Bay Area) is then responsible for distributing this need to local governments. The total housing need for each region is based on the region's forecast for population, households, and employment. Typically, the RHNA for each region is finalized through negotiations between the HCD and each region's Council of Governments. According to State law, each jurisdiction's housing element must include a strategy to meet its share of the region's housing need for four income categories that encompass all levels of housing affordability (i.e., very low – up to 50 percent of area median income, low – between 51 and 80 percent of area median income, moderate – between 81 and 120 percent of area median income, and above moderate – above 120 percent of area median income) and must be certified by the HCD. Jurisdictions that do not have capacity to meet their RHNA at all income levels must rezone sites with appropriate development standards to accommodate the unmet capacity.

[43] ABAG, *Projections* 2013, p. 71.
[44] ABAG, Plan Bay Area Priority Development Area Showcase, February 2015. Available online at http://gis.abag.ca.gov/website/PDAShowcase/. Accessed March 7, 2016.

The RHNA process seeks to ensure that each jurisdiction recognizes its responsibility to provide housing that represents the number of additional residential units that would be required to accommodate the anticipated growth in households; to replace expected demolitions and conversions of housing units to non-housing uses; and to achieve a future vacancy rate that allows for the healthy functioning of the housing market. The RHNA process does not necessarily encourage or promote growth; rather, it requires each jurisdiction to anticipate projected growth, so that it can grow in ways that enhance quality of life; improve access to jobs, transportation, and housing; and not adversely impact the environment.

The *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022* was published in July 2013 and covers the planning period from January 31, 2015, to January 31, 2023. The HCD determined that the Bay Area must plan for 187,990 new housing units from 2014-2022. This determination is based on population projections produced by the California Department of Finance, which also took into account the uncertainty regarding the economy and regional housing markets. For this planning period, the HCD made an adjustment to account for abnormally high vacancies and unique market conditions due to prolonged recessionary conditions, high unemployment, and unprecedented foreclosures. As a result, the RHNA from the HCD for this planning period is lower than the RHNA for the 2007-2014 planning period. The housing allocation is expressed not only as an overall housing production target to alleviate tight housing market conditions and reduce long-distance commuting, but, more importantly, as separate targets for production of housing affordable to various household income categories. San Francisco's share of the regional housing need for 2014 through 2022 is 28,869 new units, with approximately 57 percent to be affordable. This represents a little over 15 percent of the regional total over the 2104-2022 time frame and amounts to a Citywide housing production goal of about 3,609 units per year. San Francisco's share of the RHNA is incorporated into the City's 2014 Housing Element (originally adopted in March 2011 and most recently re-adopted with amendments on April 27, 2015). As required by State law, the Housing Element of the *General Plan* discusses the City's fair share allocation of regional housing needs by income as projected by ABAG.

LOCAL

San Francisco General Plan

The *General Plan* includes objectives, policies, and programs related to population, housing, and employment. Several of the priority policies of the *General Plan* establish the City's interest in affordable housing, economic diversity, and a broad range of employment opportunities for residents. In addition, the Commerce and Industry Element of the *General Plan* sets forth goals for evaluating land use and other public policy directions that guide economic development. The element acknowledges that many objectives for commerce and industry are largely beyond the

realm of local control – particularly land use control – but puts forth generalized objectives as a framework for guiding public and private decisions related to economic development. In addition, the Housing Element of the *General Plan* describes housing needs and identifies the capacity for new housing in the City based on land supply and development capacity. This element focuses on the City's critical need for affordable housing. The Housing Element establishes goals for housing production, as well as policies related to mitigating the impacts of growth on the housing market that are relevant to evaluation of the Proposed Project.

Housing Element

The Housing Element is a major part of the *General Plan*. It sets forth the City's overall housing policies and seeks to ensure adequate housing for current and future San Franciscans by providing opportunities for housing development, rather than constraining opportunities. The Housing Element is comprised of two parts. Part I contains the background data and needs analysis, which form the basis for policy formulation, and Part II contains the list of objectives and policies, and descriptions of the programs to be carried out over the next five years to implement these objectives and policies. The Housing Element details objectives and policies that address growing housing demand, focus on strategies that can be accomplished within the City's limited land supply, and meet the housing goals developed during the public outreach for the Housing Element update, which include (1) prioritizing permanently affordable housing; (2) recognizing and preserving neighborhood character; (3) integrating housing, jobs, transportation, and infrastructure; and (4) continuing to be a regional model of sustainability.

On March 24, 2011, the San Francisco Planning Commission certified the Final Environmental Impact Report (EIR) for the 2004 and 2009 Housing Element. On June 21, 2011, the San Francisco Board of Supervisors adopted the 2009 Housing Element as the Housing Element of the *San Francisco General Plan*. The Planning Department recirculated for public review a revised Chapter VII, Alternatives, of the Final EIR (Revised EIR) on December 18, 2013. The Planning Commission certified the 2004 and 2009 Housing Element Final EIR, with the Revised Alternatives Analysis, on April 24, 2014. On June 17, 2014, the Board of Supervisors denied an appeal of the certification, and re-adopted the 2009 Housing Element, with minor revisions, as the 2014 Housing Element. The 2014 Housing Element was most recently re-adopted with amendments on April 27, 2015.

Housing element law (California Government Code Section 65580 et seq.) requires local jurisdictions to adequately plan for their existing and projected housing needs for all segments of its population, such that all communities contribute to the attainment of the State's housing goals. HCD is the responsible State agency tasked with allocating the region's share of the Statewide housing need to regional agencies; in the Bay Area, ABAG provides this allocation, based on the region's forecast for population, households, and employment. San Francisco's share of the

regional housing need is 28,869 new units, of which approximately 57 percent must be affordable. Under State law, all housing elements must be reviewed by the Department of Housing and Community Development; housing elements are certified if they comply with State law and meet certain planning objectives. As discussed in the Housing Element, some 47,020 new housing units could potentially be built on numerous in-fill development opportunity sites under current zoning allowances.[45] In addition, some 22,870 new housing units could be accommodated in vacant or nearly vacant lands currently or previously zoned "Public" such as Mission Bay, Treasure Island, and Hunters Point Naval Shipyard. Recent legislation has allowed the accessory dwelling units, also known as secondary dwelling units or in-law units, to be built on existing buildings in certain districts, including the Board of Supervisors' Districts 8 and 3.[46]

The following objectives and policies of the Housing Element are relevant to the Proposed Project:

Objective 1	Identify and make available for development adequate sites to meet the City's housing needs, especially permanently affordable housing.
Policy 1.1	Plan for the full range of housing needs in the City and County of San Francisco, especially affordable housing.
Policy 1.3	Work proactively to identify and secure opportunity sites for permanently affordable housing.
Policy 1.4	Ensure community based planning processes are used to generate changes to land use controls.
Policy 1.6	Consider greater flexibility in number and size of units within established building envelopes in community based planning processes, especially if it can increase the number of affordable units in multi-family structures.
Policy 1.8	Promote mixed use development, and include housing, particularly permanently affordable housing, in new commercial, institutional or other single use development projects.
Policy 1.9	Require new commercial development and higher educational institutions to meet the housing they generate, particularly the need for affordable housing for lower income workers and students.
Policy 1.10	Support new housing projects, especially affordable housing, where households can easily rely on public transportation, walking and bicycling for the majority of daily trips.
Objective 4	Foster a housing stock that meets the needs of all residents across lifecycles.
Policy 4.1	Develop new housing, and encourage the remodeling of existing housing, for families with children.

[45] San Francisco Planning Department, Data and Needs Analysis, p. I.65.

[46] San Francisco Planning Department, *sf-ADU: A Guide for Homeowners, Designers, and Contractors Considering Adding an Accessory Dwelling Unit to an Existing Residence in San Francisco*, prepared by Openscope Studio, July 2015.

Policy 4.4 Encourage sufficient and suitable rental housing opportunities, emphasizing permanently affordable rental units wherever possible.

Policy 4.5 Ensure that new permanently affordable housing is located in all of the city's neighborhoods, and encourage integrated neighborhoods, with a diversity of unit types provided at a range of income levels.

Policy 4.6 Encourage an equitable distribution of growth according to infrastructure and site capacity.

Objective 11 Support and respect the diverse and distinct character of San Francisco's neighborhoods.

Policy 11.1 Promote the construction and rehabilitation of well-designed housing that emphasizes beauty, flexibility, and innovative design, and respects existing neighborhood character.

Policy 11.3 Ensure growth is accommodated without substantially and adversely impacting existing residential neighborhood character.

Policy 11.4 Continue to utilize zoning districts which conform to a generalized residential land use and density plan and the General Plan.

Policy 11.7 Respect San Francisco's historic fabric, by preserving landmark buildings and ensuring consistency with historic districts.

Policy 11.8 Consider a neighborhood's character when integrating new uses, and minimize disruption caused by expansion of institutions into residential areas.

Policy 11.1 Use new housing development as a means to enhance neighborhood vitality and diversity.

Objective 12 Balance housing growth with adequate infrastructure that serves the City's growing population.

Policy 12.1 Encourage new housing that relies on transit use and environmentally sustainable patterns of movement.

Policy 12.2 Consider the proximity of quality of life elements, such as open space, child care, and neighborhood services, when developing new housing units.

Policy 12.3 Ensure new housing is sustainably supported by the City's public infrastructure systems.

Objective 13 Prioritize sustainable development in planning for and constructing new housing.

Policy 13.1 Support "smart" regional growth that locates new housing close to jobs and transit.

Policy 13.3 Promote sustainable land use patterns that integrate housing with transportation in order to increase transit, pedestrian, and bicycle mode share.

Central Waterfront Area Plan

The *Central Waterfront Area Plan* is part of the larger Eastern Neighborhoods Planning Area, which is composed of the Mission, Central Waterfront, East SOMA, and Showplace Square/Potrero Hill neighborhoods. The *Central Waterfront Area Plan* was adopted by the Planning Commission in 2008. It is bounded by Mariposa Street on the north, San Francisco Bay on the east, Islais Creek on the south, I-280 on the west, and includes Pier 70. The *Central Waterfront Area Plan* identifies Pier 70 as playing a substantial role in defining the Central Waterfront. However, because the Port of San Francisco was in an ongoing planning process for the waterfront at the time of the Eastern Neighborhoods community planning process, the *Central Waterfront Area Plan* does not include changes to the zoning and height controls for the majority of Pier 70, in recognition that the zoning may be modified to reflect the outcome of the Port's Pier 70 area planning process.[47] The *Central Waterfront Area Plan* strives to meet six key objectives on housing production and retention:

1. The Plan strives to construct new housing affordable to people with a wide range of incomes through the rezoning of some of the City's industrial lands. It assists households at low and very low incomes through inclusionary and land dedication strategies. It aims to help people making above the 120 percent of median income threshold for inclusionary housing but below the amount required to afford market-rate units, through "middle income" development options.
2. The Plan strives to retain and improve existing housing, in recognition of the fact that sound existing housing is one of the most valuable sources of housing the City has.
3. The Plan ensures that residential development meets not only the affordability needs, but the other needs, such as unit size, number of bedrooms, community services, and neighborhood amenities, to create a high quality of life for all individuals and families in the Eastern Neighborhoods.
4. The Plan aims to lower the costs of housing production to translate into lower-priced units, by enabling cost-effective construction and by recognizing that "time is money" in reducing unnecessary processes.
5. The Plan aims to promote health and well-being for residents, through well-designed, environmentally friendly neighborhoods and units.
6. The Plan aims to continue the City's ongoing efforts to increase affordable housing and production, through increased funding available for affordable housing through City, State, Federal and other sources.

The following objectives and policies of the *Central Waterfront Area Plan* are relevant to the Proposed Project:

Objective 2.1 Ensure that a significant percentage of new housing created in the Central Waterfront is affordable to people with a wide range of incomes.

[47] City and County of San Francisco, *Central Waterfront Area Plan*, December 2008, p. 8.

Policy 2.1.1 Require developers in some formerly industrial areas to contribute towards the City's very low, low, moderate, and middle income needs as identified in the Housing Element of the General Plan.

Policy 2.1.2 Provide land and funding for the construction of new housing affordable to very low and low-income households.

Policy 2.1.3 Provide units that are affordable to households at moderate and "middle incomes" – working households earning above traditional below-market-rate thresholds but still well below what is needed to buy a market priced home, with restrictions to ensure affordability continues.

Objective 2.3 Require that a significant number of units in new developments have two or more bedrooms except senior housing and SRO [single room occupancy] developments unless all below market rate unit are two or more bedroom units.

Policy 2.3.1 Target the provision of affordable units for families.

Policy 2.3.2 Prioritize the development of affordable family housing, both rental and ownership, particularly along transit corridors and adjacent to community amenities.

Policy 2.3.3 Require that a significant number of units in new developments have two or more bedrooms, except Senior Housing and SRO developments.

Policy 2.3.4 Encourage the creation of family supportive services, such as child care facilities, parks and recreation, or other facilities, in affordable housing or mixed-use developments.

Policy 2.3.5 Explore a range of revenue-generating tools including impact fees, public funds and grants, assessment districts, and other private funding sources, to fund community and neighborhood improvements.

Policy 2.3.6 Establish an impact fee to be allocated towards an Eastern Neighborhoods Public Benefit Fund to mitigate the impacts of new development on transit, pedestrian, bicycle, and street improvements, park and recreational facilities, and community facilities such as libraries, child care and other neighborhood services in the area.

Objective 2.4 Lower the cost of the production of housing.

Policy 2.4.1 Require developers to separate the cost of parking from the cost of housing in both for sale and rental developments.

Policy 2.4.2 Revise residential parking requirements so that structured or off-street parking is permitted up to specified maximum amounts in certain districts, but is not required.

Policy 2.4.3 Encourage construction of units that are "affordable by design."

Objective 2.6 Continue and expand the City's effort to increase permanently affordable housing production and availability.

Policy 2.6.1 Continue and strengthen innovative programs that help to make both rental and ownership housing more affordable and available.

Jobs-Housing Linkage Program

The Jobs-Housing Linkage Program was first implemented in 1985 as the Office-Affordable Housing Production Program as one means by which the impacts of Downtown office employment growth would be managed and mitigated. The original exaction was limited to Downtown (C-3 Zoning Districts) office development. The program was updated and expanded in 1997. The *Jobs Housing Nexus Analysis* prepared in 1997 for the City demonstrated the relationship between all types of new commercial development and the need for affordable housing.[48]

Policy 1.9 of the 2009 Housing Element calls for enforcement and monitoring of the Jobs-Housing Linkage Program, requiring that new commercial development (as well as institutions of higher education) in the City provide affordable housing or pay an in-lieu fee to meet the housing need attributable to employment or student population growth and new commercial development, particularly the demand for new housing affordable to low- and moderate-income households. The current Jobs-Housing Linkage Program applies to office and other types of developments. The program is incorporated into Section 413 of the Planning Code.

Residential Inclusionary Affordable Housing Program

Planning Code Section 415, or the Inclusionary Affordable Housing Program, requires that a project involving ten or more new dwelling units must (a) provide on-site below market rate units equal to 12 percent of the total number of units, (b) provide off-site below market rate units equal to 20 percent of the total number of units, or (c) pay a fee equivalent to 20 percent of the total number of units.[49]

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would

[48] Keyser Marston Associates, Inc. and Gabriel Roche, Inc., *Jobs Housing Nexus Analysis, City of San Francisco*, July 1997. Prepared for the Office of Affordable Housing Production Program, City and County of San Francisco.

[49] The Proposed Project exceeds requirements of Proposition C, which was passed by ballot in June 2016. The Proposed Project is subject to Proposition F, which was passed in November 2014 and set affordable housing rates for the 28-Acre Site at 30 percent. The remainder of the project site is subject to the Residential Inclusionary Affordable Housing Program (Planning Code Section 415).

result in a significant impact on population and housing. Implementation of the Proposed Project would have a significant effect on population and housing if the project would:

C.1 Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);

C.2 Displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing; or

C.3 Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

APPROACH TO ANALYSIS

CEQA Guidelines Section 15064(e) notes that an economic or social change by itself would not be considered a significant effect on the environment. Population growth is considered in the context of local and regional plans and population, housing, and employment projections. Generally, a project that induces population growth is not viewed as having a significant impact on the environment unless this growth is unplanned and results in significant physical impacts on the environment. Thus, the growth and changes in employment and population, and potential demand for housing that would occur with implementation of the Proposed Project would not be adverse physical impacts in themselves. However, the physical changes needed to accommodate project-related growth may have physical impacts on the environment. Project-related growth and the increase in population would primarily result in increased demand on transportation infrastructure, public services, utilities and service systems, and recreational facilities, as well as increases in ambient noise levels and criteria air pollutant and toxic air contaminant emissions. These physical impacts are evaluated in Section 4.E, Transportation and Circulation; Section 4.F, Noise and Vibration; Section 4.G, Air Quality; Section 4.H, Greenhouse Gas Emissions; Section 4.J, Recreation; Section 4.K, Utilities and Services Systems; and Section 4.L, Public Services.

The impact analysis considers whether the Proposed Project would contribute to substantial residential population and employment growth. The Maximum Residential Scenario and the Maximum Commercial Scenario are analyzed separately. Direct population growth would result from the residents who would occupy the newly developed housing units and the people who would be employed by the proposed residential, commercial, and retail/arts/light-industrial (RALI) uses at the project site, as well as from temporary construction employment. Indirect or secondary growth is often defined as development that occurs as infrastructure is expanded to previously unserved or underserved areas. This type of development pattern typically occurs in suburban areas adjacent to or near undeveloped lands and is not applicable to the project site, which is located in a built-up urban environment that is already served by infrastructure. The

analysis also considers whether substantial numbers of residents, housing units, or employees would be displaced.

The analysis compares the population, employment, and housing characteristics that would result from development of the Proposed Project to existing conditions. The 2010 U.S. Census, 2013 ACS, 2014 Housing Element, and ABAG's *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022* were used to prepare the analysis because they are the most recent data consistently available for the project site across all population, employment, and housing indices.

PROJECT FEATURES

The Proposed Project entails the development of the 28-Acre Site and the Illinois Parcels (20th/Illinois Site and the Hoedown Yard). It would include residential, commercial, and RALI uses. Under the provisions of the proposed Special Use District, the Proposed Project would provide a flexible land use program under which certain parcels could be developed for primarily commercial or residential uses, with much of the ground floor dedicated to RALI uses.

The two scenarios, the Maximum Residential Scenario and the Maximum Commercial Scenario, would have separate effects on population and housing at the project site. Under the Maximum Residential Scenario, there would be up to 3,025 residential units, 1,102,250 gross square feet (gsf) of commercial use, and 479,980 gsf of RALI use (269,495 gsf of retail, 67,375 gsf of restaurant, and 143,110 gsf of art/light-industrial). Under the Maximum Commercial Scenario, there would be 1,645 residential units, 2,262,350 gsf of commercial use, and 486,950 gsf of RALI use (275,075 gsf of retail use, 68,765 gsf of restaurant use, and 143,110 gsf of art/light-industrial).

As stated under "Households" on pp. 4.C.3-4.C.4, ABAG *Projections 2013* estimates 2.27 persons per household for San Francisco in 2015. Because household population projections tend to fluctuate over time, for the purpose of this analysis, the 2015 household size of 2.27 is used. Therefore, the Proposed Project would have a residential on-site population of approximately 6,868 residents under the Maximum Residential Scenario (4,881 residents on the 28-Acre Site and 1,987 residents on the Illinois Parcels), and approximately 3,735 residents under the Maximum Commercial Scenario (2,497 residents on the 28-Acre Site and 1,238 residents on the Illinois Parcels). (See Table 4.C.4: Population and Employment Estimates for the Maximum Residential Scenario and the Maximum Commercial Scenario.)

Under both the Maximum Residential Scenario and Maximum Commercial Scenario, the proposed uses would displace approximately 60 to 70 existing on-site employees. As part of the Proposed Project, these employees would be offered the opportunity to lease space on the project site or to relocate to other Port properties to the extent required under California Relocation

Assistance Law (California Government Code Section 7260 et seq.), and applicable regulations. Total employment under the Maximum Residential Scenario would be 5,599 employees, with approximately 5,443 employees at the 28-Acre Site and 156 employees at the Illinois Parcels. Total employment under the Maximum Commercial Scenario would be 9,768 employees, with approximately 8,754 employees at the 28-Acre Site and 1,014 employees at the Illinois Parcels.[50,51] Potential impacts on population, housing, and employment are analyzed for both scenarios. (For a summary of employment by scenario and corresponding land use, see Table 4.C.5: Total Employment at Build-Out by Land Use under the Maximum Residential Scenario, p. 4.C.21, and Table 4.C.6: Total Employment at Build-Out by Land Use under the Maximum Commercial Scenario, p. 4.C.30.)

Table 4.C.4: Population and Employment Estimates for the Maximum Residential Scenario and the Maximum Commercial Scenario

	Maximum Residential Scenario	Maximum Commercial Scenario
Population[1]		
28-Acre Site	4,881	2,497
Illinois Parcels	1,987	1,238
Total Residents	**6,868**	**3,735**
Employment[2]		
28-Acre Site	5,443	8,754
Illinois Parcels	156	1,014
Total Employees	**5,599**	**9,768**

Notes:

1 ABAG *Projections 2013* estimates 2.27 persons per household in San Francisco for 2015.

2 Employment numbers for residential, open space, and parking uses were determined using the factors in Table III.C-7, p. III.C-12, from the San Francisco Planning Department, *Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR*, November 2009.

Source: City of San Francisco, *Transportation Impact Analysis Guidelines for Environmental Review*, Table C-1, p. C-3, October 2002

50 City of San Francisco, *Transportation Impact Analysis Guidelines for Environmental Review*, Table C-1, p. C-3, October 2002. Available online at http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=6753. Accessed November 9, 2015.

51 Employment numbers for residential, open space, and parking uses were determined using Table III.C-7, p. III.C-12, from the San Francisco Planning Department, *Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR*, November 2009.

IMPACT EVALUATION

Impact PH-1: The Proposed Project would not induce substantial population growth in an area, either directly or indirectly. *(Less than Significant)*

The project site is located within the *Central Waterfront Area Plan*, part of the larger Eastern Neighborhoods Planning Area. The Eastern Neighborhoods community planning process initiated by the Planning Department encourages new housing to be located at the Central Waterfront due to this area's proximity to transit and essential services.[52] The Housing Element identifies the Central Waterfront Area for growth of 2,000 residential units; however, this does not include the Pier 70 project site.[53] The *Central Waterfront Area Plan* encourages the transformation of traditional Port activities (i.e., industrial uses) to accommodate a substantial amount of new housing. The Plan sees the Central Waterfront as "critical to supporting a much-needed increase in commercial services, enlivening open spaces, and creating a vibrant and cohesive residential neighborhood."[54] Additionally, the project site is located in the Port of San Francisco PDA, an area identified by the City and ABAG as a possible area for population and housing growth.[55]

Maximum Residential Scenario

Population

Up to 3,025 new residential units would be developed under the Maximum Residential Scenario (2,150 units on the 28-Acre Site and 875 units on the Illinois Parcels), which would result in approximately 6,868 new residents at the project site.[56] New housing associated with the Proposed Project would add to the City's contribution to the regional housing supply.

Based on the 2010 U.S. Census, the new residents would represent an approximately 448 percent increase in the total number of residents located in Census Tract 226, which comprises most of the *Central Waterfront Area Plan*. As discussed above, the project site is located within an area of the SOMA Planning District, which has an average housing density of 54 units per acre.[57] The Proposed Project would result in a maximum housing density of about 86 residential units per acre (78 residential units per acre on the 28-Acre Site and 125 residential units per acre on the Illinois Parcels), assuming maximum development of 3,025 new residential units with the Maximum Residential Scenario; thus, the average housing density of the Proposed Project would be higher than the average housing density in this portion of the SOMA Planning District.

[52] San Francisco Planning Department, Data and Needs Analysis, p. A.3.
[53] San Francisco Planning Department, Data and Needs Analysis, p. A.8.
[54] City and County of San Francisco, *Central Waterfront Area Plan*, December 2008, p. 21.
[55] ABAG, *Projections 2013*, p. 75.
[56] ABAG *Projections 2013* estimates 2.27 persons per household in San Francisco for 2015.
[57] San Francisco Planning Department, Data and Needs Analysis, Map 6, p. 70.

Local policy emphasizes promoting mixed use development with moderate to high residential densities to meet the City's housing needs and reduce greenhouse gas emissions; this has resulted in the development of buildings with more than 10 units (91 percent of the new construction in the last 10 years). A large proportion of new housing development has occurred in areas of the City well served by transit and essential services such as the SOMA Planning District, which includes the *Central Waterfront Area Plan* and the project site. The *Central Waterfront Area Plan* identifies Pier 70 as playing a substantial role in defining the Central Waterfront; however, changes to the zoning and height controls at Pier 70 were not included in the analysis of the Eastern Neighborhoods community planning and rezoning program in recognition of the Port's Pier 70 area master planning efforts. In 2014 the construction of new housing in the SOMA Planning District more than doubled compared to that in the previous four years (approximately 54 percent of net new housing Citywide), with almost 74 percent in developments with 10 or more units.

Although the addition of approximately 6,868 new residents would be substantial for the project area, it would be not be substantial for the City as a whole, as it would represent approximately 2.4 percent of the projected increase in Citywide population growth of 280,465 persons between 2010 and 2040 (from 805,235 in 2010 to 1,085,700 in 2040), and less than 1 percent of the projected increase in the Bay Area-wide population growth of approximately 2.1 million persons over the same time period.

Although the residential density and number of units are higher than what is called for in the Housing Element, the amount of housing and residential population within the SOMA Planning District has increased more rapidly than in many other parts of the City, and the rate of growth and increased densities are consistent with the goals of the *Central Waterfront Area Plan*, the Housing Element, and *Plan Bay Area*. Further, the proposed residential density would not be considered to result in a substantial adverse impact in and of itself because the site is located in proximity to major transit corridors (e.g., T-Third Street, 22-Fillmore, and CalTrain) and employment centers (e.g., the Financial District, Mission Bay, and the SOMA area); is within an area that is currently being developed with higher residential densities; and is identified in City and regional planning documents as an area designated to accommodate a substantial proportion of the City's future residential growth, and so is appropriate for higher residential densities.

The scale of residential development from the Maximum Residential Scenario would also be above the estimated population growth within the Port of San Francisco PDA (3,059 residents

and 1,497 households by 2040).[58,59] However, the development of residential uses in this area would conform with ABAG and the City's designation of the Port of San Francisco as one of 12 PDAs that are served by existing utilities, infrastructure, and transit, and with the potential to accommodate substantial population and housing growth in the City and Bay Area.[60] The Port of San Francisco PDA remains a viable location for population growth due to its location near transit and neighborhood-serving amenities. The construction of residential units associated with the Proposed Project would assist the City in meeting its share of regional housing needs identified in the *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022* of 28,869 units by 2022.

The Proposed Project would contribute to the City's supply of affordable housing. Under the Proposed Project, 30 percent of all completed residential units on the 28-Acre Site would be required to be offered at below market rate prices, and a majority of all residential units constructed would be available as rentals. The Proposed Project's affordable housing requirement would be established through transaction documents between the Port and Forest City for the Proposed Project. The 30 percent affordable housing requirement would exceed the on-site (12 percent of all units) and off-site (20 percent of all units, within 1 mile) percentages required by Planning Code Section 415. The Illinois Parcels would also contribute to affordable housing by complying with the provisions of San Francisco Planning Code Section 415. The Proposed Project would assist San Francisco in meeting its regional housing needs allocation and affordability metrics, as outlined in the *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022.*

For the reasons discussed above, the Maximum Residential Scenario would not induce substantial[61] population growth in the Central Waterfront or Citywide, either directly, through the development of a large number of new residential units, or indirectly, through the extension or expansion of roads or other public infrastructure that could allow more growth than could be served by existing infrastructure. The increase in population from the Proposed Project would not, in itself, result in adverse physical effects, but would serve to advance key City policy

[58] ABAG, *Projections 2013,* p. 75. ABAG defines the Port of San Francisco PDA as a Mixed-Use Corridor Place Type (transit-served areas with a mix of moderate-density housing, services, retail, employment, and civic or cultural uses).

[59] ABAG, Plan Bay Area Priority Development Area Showcase, February 2015. Available online at http://gis.abag.ca.gov/website/PDAShowcase/. Accessed March 7, 2016.

[60] San Francisco County Priority Development Areas include Bayview/Hunters Point Shipyard/Candlestick Point; Balboa Park, Downtown-Van Ness-Geary; Eastern Neighborhoods; Mission Bay; Port of San Francisco; Transbay Terminal; Treasure Island; San Francisco/San Mateo Bi-County Area (with Brisbane); 19th Avenue Corridor, Market and Octavia, and Mission-San Jose Corridor.

[61] Substantial growth is defined as increases in population that are unplanned, without consideration of or planning for infrastructure, services, and housing needed to support proposed residents, employees, and visitors.

objectives, such as providing housing in appropriate locations next to Downtown and other employment-generating areas, and would further the City's Transit First policy.[62] Thus, the Proposed Project's contribution to the population and employment growth in the immediate project area would continue current development trends in the City and region and would focus development in an area that would be able to accommodate such future growth. Therefore, impacts of the Maximum Residential Scenario on population growth would be less than significant, and no mitigation measures are necessary.

Employment

Temporary Construction Employment

There would be direct, but temporary, growth in construction jobs on the project site as a result of the Proposed Project. Project construction would be phased over approximately 11 years, beginning in 2018 and concluding in 2029. Temporary construction employment would vary, depending on the construction phase. Daily average and maximum (peak) employment is estimated for the various phases of construction. However, it is assumed that an average of about 70 construction workers would be at the site per day, with a greater number during peak periods of building construction.[63] Peak periods of construction would involve having workers on the site for a combination of activities involving building construction, architectural coatings, and paving, with a maximum of 419 total daily workers.[64]

San Francisco and the five-county subregion of San Francisco, Alameda, Contra Costa, Marin, and San Mateo counties have experienced persistently high unemployment in recent years. The construction sector was particularly affected by the 2007-2008 mortgage crisis and subsequent recession. Between 2007 and 2010, construction jobs in the five-county subregion declined by nearly 38,000 jobs, or about a third, over this period. However, the trend for the five counties as a whole began to reverse in 2011, with an increase of about 520 construction jobs in the five-county subregion that year. Construction job growth has continued, and between 2010 and July 2014, more than 22,700 construction jobs were added in the five-county subregion. Therefore, as of July 2014, the loss in construction employment in the five-county subregion since 2007 stands at about 15,000 jobs.[65] Given the continuing number of unemployed construction workers, nearly

[62] The Transit First policy is a section of the San Francisco City Charter that directs City officers, boards, commissions, and departments to prioritize public transportation, bicycling, and walking, over use of a private automobile.

[63] Forest City, Pier 70 SUD Project EIR Data Request No. 2, February 6, 2015.

[64] Ibid.

[65] California Employment Development Department, *Regional Economic Analysis Profile: San Francisco Bay Area Economic Market*, February 2015. Available online at http://www.labormarketinfo.edd.ca.gov/Publications/REA-Reports/SanFranciscoBayArea-REAP2015.pdf. Accessed November 17, 2015.

all project construction labor needs would readily be met by current residents of San Francisco and the rest of the five-county subregion.

Thus, it is anticipated that construction employees not already living in the City would commute from their permanent residences elsewhere in the Bay Area rather than relocate from more distant cities or towns. Once construction phases are complete, construction workers would typically seek employment at other job sites throughout the region that require their particular construction skill. Therefore, construction of the Proposed Project under the Maximum Residential Scenario would not generate a substantial, unplanned population increase. Temporary, project-related impacts associated with construction employment would be less than significant, and no mitigation measures are necessary.

Permanent Employment

There are currently approximately 60 to 70 employees on the project site. Included as part of the Proposed Project, the Port would develop a plan for tenant relocation to the extent required under the California Relocation Assistance Law (California Government Code Section 7260 et seq.), and applicable regulations. The Port would also try to relocate larger-scale tenants to other available, suitable Port property. In accordance with the Term Sheet between the Port and Forest City, Forest City has offered the tenants of Building 11 (the Noonan Building), most of whom are on month-to-month leases, replacement space at Pier 70 after the Noonan Building is demolished, with rent based on the Port's current parameter rent schedule for the Noonan Building. Therefore, all existing employment at the project site would largely remain the same, although some jobs would relocate to a different location.

As shown in Table 4.C.5: Total Employment at Build-Out by Land Use under the Maximum Residential Scenario, the Maximum Residential Scenario would result in approximately 5,599 employees at project completion. The projected employment increase at the project site would represent approximately 0.9 percent of total jobs in the City (617,420) and 1.2 percent of employed residents in the City (460,450) in 2015. As stated under "Total Jobs" on p. 4.C.8, ABAG projects that the number of total jobs in the City will increase to 759,500 in 2040 and that the number of employed residents under the Maximum Residential Scenario would increase to 571,580 by 2040. In 2040, the employment increases would represent approximately 0.7 percent of jobs and 0.9 percent of employed residents in the City. On a Citywide basis, this incremental increase in employment due to implementation of the Maximum Residential Scenario would not be considered significant, and would not exceed the employment growth identified by ABAG. Employment growth is also within the growth projections for the Port of San Francisco PDA (149,684 jobs by 2040).[66]

[66] ABAG, Plan Bay Area Priority Development Area Showcase, February 2015. Available online at http://gis.abag.ca.gov/website/PDAShowcase/. Accessed March 7, 2016.

Table 4.C.5: Total Employment at Build-Out by Land Use under the Maximum Residential Scenario

Land Use	Total Employment at Build-Out
28-Acre Site	
Residential (1,870,000 gsf [2,150 units])	77[1]
Commercial (1,095,650 gsf)	3,970[2]
Retail/Arts/Light-Industrial (RALI)	
Retail (241,655 gsf)	691[3]
Restaurant (60,415 gsf)	173[4]
Arts/Light-Industrial (143,110 gsf)	519[5]
Open Space (6.5 acres)	2[6]
Parking (2,708 spaces)	11[7]
Subtotal	**5,443**
Illinois Parcels	
Residential (760,000 gsf [875 units])	28[1]
Commercial (6,600 gsf)	24[2]
Retail/Arts/Light-Industrial (RALI)	
Retail (27,840 gsf)	80[3]
Restaurant (6,960 gsf)	20[4]
Open Space (2.5 acres)	1[6]
Parking (663 spaces)	3[7]
Subtotal	156
Total	**5,599**

Notes:

[1] Residential employment would include security and leasing/administration personnel. Information provided by the project sponsors on October 20, 2015 indicates there would be seven employees per residential building.

[2] Total employment for commercial land uses was calculated using the "Office – General" Land Use Type in Table C-1 of the *Transportation Impact Guidelines*, which indicates that average density is 276 gsf per employee.

[3] Total employment for retail land uses was calculated using the "General Retail" Land Use Type in Table C-1 of the *Transportation Impact Guidelines*, which indicates that average density is 350 gsf per employee.

[4] Total employment for restaurant land uses was calculated using the "Eating/Drinking" Land Use Type in Table C-1 of the *Transportation Impact Guidelines*, which indicates that average density is 350 gsf per employee.

[5] Total employment for Arts/Light-Industrial land uses was calculated using the "Office – General" Land Use Type in Table C-1 of the *Transportation Impact Guidelines*, which indicates that average density is 276 gsf per employee.

[6] Total employment for open space land uses was calculated using 0.26 employee per acre based on Table III.C-7 from the Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR.

[7] Total employment for parking land uses was calculated using 270 spaces per employee based on Table III.C-7 from the *Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR.*

Sources: City of San Francisco, *Transportation Impact Guidelines*, Table C-1, 2002; San Francisco Planning Department, *Candlestick Point-Hunters Point Shipyard Phase II Development* EIR, November 2009, Table III.C-7, p. III.C-12; e-mail communication from Forest City, October 20, 2015

Maximum Commercial Scenario

Population

Up to 1,645 new residential units would be developed under the Maximum Commercial Scenario (1,100 on the 28-Acre Site and 545 on the Illinois Parcels), which would result in approximately 3,735 new residents at the project site.[67]

Based on the 2010 U.S. Census, the new residents would represent an approximately 243 percent increase over the total number of residents located in Census Tract 226, which comprises most of the Central Waterfront Area. Although this increase would be large for the project area, it would be not be substantial for the City as a whole, as it would represent 1.3 percent of the total Citywide population growth from 805,235 in 2010 to 1,085,700 in 2040, and 0.03 percent of population growth in the nine-county Bay Area region.[68]

Similar to the Maximum Residential Scenario, the Maximum Commercial Scenario is located within an area of the *Central Waterfront Area Plan*. The project site is one of several PDAs in the City identified by ABAG and the City as an area that could accommodate anticipated housing development and population growth, an objective further supported by the City's *General Plan* Housing Element and ABAG's *Plan Bay Area*. The increase in population from the Proposed Project would not, in itself, result in an adverse physical effect, but would serve to advance key City policy objectives, such as providing housing in appropriate locations next to Downtown and other employment-generating areas, and would further the City's Transit First policies. The anticipated increase in population and density would not result in significant adverse physical effects on the environment. Therefore, the Maximum Commercial Scenario would not directly result in substantial population growth beyond that planned for in the City. Impacts from the Maximum Commercial Scenario on population growth would be less than significant, and no mitigation measures are necessary.

Employment

Temporary Construction Employment

There would be direct, but temporary, growth in construction jobs in the Central Waterfront area as a result of the Proposed Project. Project construction would be phased over approximately 11 years, beginning in 2018 and concluding in 2029. Temporary construction employment would vary, depending on the construction phase. Daily average and maximum (peak) employment is

[67] ABAG *Projections 2013* estimates 2.27 persons per household in San Francisco for 2015.
[68] ABAG projects that between 2010 and 2040, San Francisco population will increase from 805,235 in 2010 to 1,085,700 in 2040, a total increase of about 280,465 persons. ABAG *Projections 2013*, p. 75.

estimated for the various phases of construction. However, it is assumed that an average of about 70 construction workers would be at the site per day, with a greater number during peak periods of building construction.[69] Peak periods of construction would involve having workers on the site for a combination of building construction, architectural coatings, and paving, with a maximum of 419 total daily workers.[70]

Similar to the Maximum Residential Scenario, construction employees not already living in the City would commute from their permanent residences elsewhere in the Bay Area rather than relocate from more distant cities or towns. Construction jobs are still recovering from the 2007 economic downturn; thus, nearly all project construction labor needs would be readily met by current residents of San Francisco and the rest of the five-county subregion. Once construction phases are complete, construction workers would typically seek employment at other job sites throughout the region that require their particular construction skill. Thus, construction of the Proposed Project under the Maximum Commercial Scenario would not generate a substantial, unplanned population increase. Temporary, project-related impacts associated with construction employment would be less than significant, and no mitigation measures are necessary.

Permanent Employment

There are currently approximately 60 to 70 employees on the project site. Included as part of the Proposed Project, the Port would develop a plan for tenant relocation to the extent required under the California Relocation Assistance Law (California Gov. Code Section 7260 et seq.), and applicable regulations. The Port would also try to relocate larger-scale tenants to other available, suitable Port property. In accordance with the Term Sheet between the Port and Forest City, Forest City has offered the tenants of Building 11 (the Noonan Building), most of whom are on month-to-month leases, replacement space at Pier 70 after the Noonan Building is demolished, with rent based on the Port's current parameter rent schedule for the Noonan Building. Therefore, all existing employment at the project site would largely remain the same, although some jobs would relocate to a different location.

As shown in Table 4.C.6: Total Employment at Build-Out by Land Use under the Maximum Commercial Scenario, the Maximum Commercial Scenario would result in approximately 9,768 employees once the project is completed (8,754 on the 28-Acre Site and 1,014 on the Illinois Parcels). The projected employment increase at the project site would represent approximately 1.6 percent of total jobs in the City (617,420) and 2.1 percent of employed residents in the City in 2015 (460,450). As stated under "Total Jobs" on p. 4.C.8, ABAG projects that the number of total jobs in the City will increase to 759,500 in 2040 and that the

[69] Forest City, Pier 70 SUD Project EIR Data Request No. 2, February 6, 2015.
[70] Ibid.

Table 4.C.6: Total Employment at Build-Out by Land Use under the Maximum Commercial Scenario

Land Use	Total Employment at Build-Out
28-Acre Site	
Residential (957,000 gsf [1,100 units])	35[1]
Commercial (2,024,050 gsf)	7,334[2]
Retail/Arts/Light-Industrial (RALI)	
Retail (238,485 gsf)	682[3]
Restaurant (59,620 gsf)	171[4]
Arts/Light-Industrial (143,110 gsf)	519[5]
Open Space (6.5 acres)	2[6]
Parking (2,849 spaces)	11[7]
Subtotal	**8,754**
Illinois Parcels	
Residential (473,000 gsf [545 units])	14[1]
Commercial (238,300 gsf)	864[2]
Retail/Arts/Light-Industrial (RALI)	
Retail (36,590 gsf)	105[3]
Restaurant (9,145 gsf)	27[4]
Open Space (2.5 acres)	1[6]
Parking (647 spaces)	3[7]
Subtotal	**1,014**
Total	**9,768**

Notes:

[1] Residential employment would include security and leasing/administration personnel. Information provided by the project sponsors on October 20, 2015, indicates that there would be seven employees per residential building.

[2] Total employment for commercial land uses was calculated using the "Office – General" Land Use Type in Table C-1 of the *Transportation Impact Guidelines*, which indicates that average density is 276 gsf per employee.

[3] Total employment for retail land uses was calculated using the "General Retail" Land Use Type in Table C-1 of the *Transportation Impact Guidelines*, which indicates that average density is 350 gsf per employee.

[4] Total employment for restaurant land uses was calculated using the "Eating/Drinking" Land Use Type in Table C-1 of the Transportation Impact Guidelines, which indicates that average density is 350 gsf per employee.

[5] Total employment for Arts/Light-Industrial land uses was calculated using the "Office – General" Land Use Type in Table C-1 of the *Transportation Impact Guidelines*, which indicates that average density is 276 gsf per employee.

[6] Total employment for open space uses was calculated using 0.26 employees per acre based on Table III.C-7 from the *Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR*.

[7] Total employment for parking uses was calculated using 270 spaces per employee based on Table III.C-7 from the *Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR*.

Sources: City of San Francisco, *Transportation Impact Guidelines*, Table C-1, 2002; San Francisco Planning Department, *Candlestick Point-Hunters Point Shipyard Phase II Development* EIR, November 2009, Table III.C-7, p. III.C-12; e-mail communication from Forest City, October 20, 2015

number of employed residents under the Maximum Commercial Scenario would increase to 571,580 by 2040. In 2040, the employment increases would represent approximately 1.3 percent of jobs in the City and 1.7 percent of employed residents in the City. On a Citywide basis, this incremental increase in employment due to implementation of the Maximum Commercial Scenario would not be considered significant, and would not exceed the employment growth identified by ABAG.

Impact PH-2: The Proposed Project would not displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing elsewhere. ***(Less than Significant)***

Maximum Residential Scenario

The Maximum Residential Scenario would result in new construction of 1,102,250 gsf of commercial uses, 269,495 gsf of retail uses, 67,375 gsf of restaurant uses, and 143,110 gsf of arts/light-industrial uses. As discussed under "Housing" on p. 4.C.3, no housing units are located on the project site; therefore, the Proposed Project would not displace existing housing. However, the projected increase in employment on the site would be expected to indirectly increase demand for housing.

Assuming each new employee on the project site would live alone and seek a new housing unit in the City, the Maximum Residential Scenario would induce demand for 5,599 new housing units (5,443 on the 28-Acre Site and 156 on the Illinois Parcels). This figure likely overstates the induced housing demand of the Maximum Residential Scenario, as (1) some employees may already live in the City and would not require new housing; (2) some employees may share a housing unit (rather than live alone); and (3) some employees would be expected to seek housing outside of the City.

A more realistic approach based on current commute patterns assumes 27.3 percent of jobs in San Francisco are held by commuters (and 72.7 percent of jobs are held by those who live in the City)[71] and that each household has approximately 1.27 workers. Under this assumption, the Maximum Residential Scenario would induce demand for about 3,205 housing units (3,115 on the 28-Acre Site and 90 on the Illinois Parcels).[72] However, it is probable that many employees would already live in San Francisco or other parts of the Bay Area and would not require new housing due to the Proposed Project. Therefore, this estimate of induced housing demand likely overestimates the number of employees who would move to the Bay Area as a result of the Proposed Project.

[71] San Francisco Planning Department, Data and Needs Analysis, p. I.14, indicates that 27.3 percent of the jobs in the City are held by commuters.

[72] San Francisco Planning Department, Data and Needs Analysis, p. I.14, indicates that the City of San Francisco has an average of 1.27 workers per household in 2015.

As part of the Maximum Residential Scenario, 3,025 new residential units would be constructed on the project site (2,150 on the 28-Acre Site and 875 on the Illinois Parcels), which would represent approximately 94 percent of the project's estimated induced housing demand. Depending on the number of new project employees who would share housing and who already live in the area, it is possible that the induced housing demand of the Maximum Residential Scenario could exceed the amount of housing that would be provided on the project site.

A portion of the Proposed Project's employment growth would be considered substantial if it resulted in housing demand that would exceed anticipated on-site, Citywide, and regional housing development. The housing demand for 3,205 residential units could be met with the new residential units proposed under the Maximum Residential Scenario, when considered in the context of the projected growth in the project area and Citywide. The induced housing demand would not exceed the number of projected housing units that would likely be developed under various area-wide planning efforts, including the Candlestick Point-Hunters Point Project, the Treasure Island / Yerba Buena Island Redevelopment Plan, and the Parkmerced Project. The induced demand for 3,205 residential units represents approximately 13.3 percent of the projected 24,180 housing units that could be developed. In addition, this demand would also be within the 28,869 and 187,990 new housing units that ABAG has allocated to San Francisco and other Bay Area cities, respectively, in the *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*.[73]

The non-residential development at the project site would be subject to San Francisco's Jobs-Housing Linkage Fee (Planning Code Section 413). The fee would apply to the gross square feet of new office, retail, restaurant, and RALI uses, to mitigate the impact of employment growth on housing supply and affordability. The Jobs-Housing Linkage Fee revenue would be deposited in the Citywide Affordable Housing Fund to be used to increase the supply of affordable housing in San Francisco.

For the reasons stated above, the Maximum Residential Scenario would not displace existing housing or create a substantial demand for housing that could not be accommodated by on-site residential development and by anticipated Citywide and regional development, including affordable housing that would be developed as a result of Jobs-Housing Linkage Fee revenue. Therefore, displacement impacts of the Proposed Project would be less than significant, and no mitigation is necessary.

[73] ABAG, *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*, p. 1.

Maximum Commercial Scenario

Assuming each new employee on the project site would live alone and seek a new housing unit in the City, the Maximum Commercial Scenario would induce demand for 9,768 new housing units. However, this figure likely overstates the induced housing demand of the Maximum Commercial Scenario because some employees would likely already live in the City, share a housing unit, or live outside of the City.

A more realistic approach based on current commute patterns assumes 27.3 percent of jobs in San Francisco are held by commuters (and 72.7 percent of jobs are held by those who live in the City) and that each household has approximately 1.27 workers. Under this assumption, the Maximum Commercial Scenario would induce demand for about 5,592 housing units (5,011 on the 28-Acre Site and 581 on the Illinois Parcels).[74,75] Similar to the Maximum Residential Scenario, it is probable that many employees would already live in the City or Bay Area and would not require new housing due to the Proposed Project. Therefore, this estimate of induced housing demand likely overestimates the number of employees who would move to the San Francisco Bay Area as a result of the Proposed Project.

As part of the Maximum Commercial Scenario, 1,645 new residential units would be constructed on the project site (1,100 on the 28-Acre Site and 545 on the Illinois Parcels), which would accommodate approximately 29.4 percent of the estimated induced housing demand. Depending on the number of new project employees who would share housing and who already live in the area, it is possible that the induced housing demand of the Maximum Commercial Scenario would exceed the amount of housing being provided on the project site.

The Proposed Project's employment growth would be considered substantial if it resulted in housing demand that would exceed anticipated on-site, Citywide, and regional housing development. A comparison of the estimated induced housing demand and the number of housing units that would be developed as part of the Maximum Commercial Scenario indicates that a substantial imbalance would not occur, as the worst-case scenario of the induced demand for 5,592 housing units would represent approximately 23.1 percent of the projected 24,180 units that could be developed under various area-wide large-scale housing projects, including the Candlestick Point-Hunters Point Project, Treasure Island / Yerba Buena Island Redevelopment Plan, and the Parkmerced Project. In addition, the *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022* has determined that 28,869 and 187,990 new housing units are

[74] San Francisco Planning Department, Data and Needs Analysis, p. 14, indicates that 27.3 percent of the jobs in the City are held by commuters.

[75] San Francisco Planning Department, Data and Needs Analysis, p. 14, indicates that the City of San Francisco has an average of 1.27 workers per household.

required for San Francisco and other Bay Area cities, respectively, between 2014 and 2022, substantially more than the 5,592 residential units that could be required under the Maximum Commercial Scenario.[76]

The non-residential development at the project site would be subject to San Francisco's Jobs-Housing Linkage Program (Planning Code Section 413). The Jobs-Housing Linkage Fee would apply to the gross square feet of new commercial, retail, restaurant, and arts/light-industrial uses, to mitigate the documented impact of employment growth on housing supply and affordability. The Jobs-Housing Linkage Fee revenue would be deposited in the Citywide Affordable Housing Fund to be used to increase the supply of affordable housing in San Francisco.

For the reasons stated above, the Maximum Commercial Scenario would not create a substantial demand for housing that could not be accommodated by on-site residential development and by anticipated Citywide and regional development, including housing that would be developed as a result of Jobs-Housing Linkage Fee revenue. Therefore, displacement impacts of the Proposed Project would be less than significant, and no mitigation is necessary.

Cumulative Impacts

Impact C-PH-1: The Proposed Project under the Maximum Residential and Maximum Commercial scenarios, in combination with past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable contribution to significant cumulative population and housing impacts. ***(Less than Significant)***

The geographic context for the analysis of cumulative impacts on population and housing is the City and the Bay Area region. The Proposed Project would potentially contribute to cumulative population and housing impacts in the context of existing, proposed, and reasonably foreseeable future development expected in San Francisco along with the region. The existing level of development in the City and region, described in the Environmental Setting on pp. 4.C.2–4.C.10, represents the baseline conditions for the evaluation of cumulative impacts. Population and employment forecasts are based on projections of future growth and take into account projects currently under review in the entitlement process.

The geographic context for an analysis of cumulative impacts to employment includes the entire Bay Area (as represented by the ABAG Planning Area[77]), since a percentage of the City population commutes to jobs outside City limits, and significant numbers of residents of other cities in the Bay Area commute to jobs within the City. The existing employment conditions,

[76] ABAG, *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*, p. 1.
[77] The ABAG Planning Area encompasses the nine Bay Area counties: Sonoma, Napa, Solano, Marin, Contra Costa, San Francisco, Alameda, San Mateo, and Santa Clara.

representing past and present trends in this geographic area, are described in the Environmental Setting on pp. 4.C.8-4.C.10.

Population

ABAG's *Projections 2013* estimates an increase in San Francisco of 101,539 households (447,350 total households), 280,465 persons (1,085,700 total population), and 190,780 jobs (759,500 total jobs) from 2010 to 2040.[78] About 92 percent of the anticipated number of households and about 88 percent of the anticipated population growth will occur in San Francisco's PDAs.[79] At the regional level ABAG's *Projections 2013* indicates that about 78 percent of anticipated housing growth and about 69 percent of anticipated population growth would occur within PDAs.[80,81]

The population increase associated with the Proposed Project would exceed the 2040 household (1,497) and population (3,059) estimates for the Port of San Francisco PDA[82] but would be within the 2040 estimates for the adjacent PDAs (26,880 new households and 79,100 new persons) and the City (101,539 new households and 280,465 new persons). The PDAs adjacent to the project site are the Eastern Neighborhoods, Mission Bay, and Bayview/Hunters Point Shipyard/Candlestick Point. The Mission Bay PDA is to the north, the Eastern Neighborhoods PDA is to the west, and the Bayview/Hunters Point Shipyard/Candlestick Point PDA is to the south. These PDAs are Urban Neighborhood Place Types (primarily moderate- to high-density residential areas with local-serving retail services and other small business or older industrial uses). The Eastern Neighborhoods, Mission Bay, and Bayview/Hunter's Point Shipyard/Candlestick Point PDA populations are anticipated to grow by 31,060, 40,850, and 7,190 residents, respectively. When considered at the Citywide and regional level, the population increase attributable to the Proposed Project would not be considered substantial because it would not exceed population increases identified by ABAG for the adjacent PDAs (when considered together), for the City as a whole, or for the nine-county Bay Area region. The City's long-range planning efforts take into account anticipated population growth as well as demand on infrastructure, public services, and housing. Consequently, implementation of the Proposed

[78] These calculations are based on ABAG *Projections* 2013, pp. 74-75.
[79] ABAG, *Projections 2013*, p. 71.
[80] ABAG, *Projections 2013*, p. 17.
[81] San Francisco Priority Development Areas include Bayview/Hunters Point Shipyard/Candlestick Point; Balboa Park; Downtown-Van Ness-Geary; Eastern Neighborhoods; Mission Bay; Port of San Francisco; Transbay Terminal; Treasure Island; San Francisco/San Mateo Bi-County Area (with Brisbane); 19th Avenue Corridor; Market and Octavia; and Mission-San Jose Corridor.
[82] ABAG, Plan Bay Area Priority Development Area Showcase, February 2015. Available online at http://gis.abag.ca.gov/website/PDAShowcase/. Accessed March 7, 2016.

Project would not contribute substantially to significant cumulative impacts associated with population and housing growth.

The Proposed Project would directly increase the on-site population within the context of an established urban area with high levels of local and regional transit services and facilities, and would include other neighborhood amenities and services that could accommodate this increase. This direct population growth is considered planned growth, because the Proposed Project has been included in the City's population planning projections. By 2040, approximately 88 percent of San Francisco's projected population growth is expected to occur within PDAs, which includes the project site.[83] Although the scale of residential development from the Proposed Project would be greater than the estimated 2040 household and population estimates identified by ABAG for the Port of San Francisco PDA, the development of residential uses in this area would conform with ABAG and the City's designation of the Port of San Francisco as one of 12 PDAs that are served by existing utilities, infrastructure, and transit, and with the potential to accommodate future population and housing growth in the City and Bay Area region.[84]

Indirect growth (or unplanned growth) includes residential and employment growth in surrounding neighborhoods resulting from an expansion of local infrastructure and public services. The Proposed Project would improve the on-site infrastructure and transportation network, but would not build or expand infrastructure or public services that could encourage additional local growth beyond that already planned. Therefore, the Proposed Project would not result in substantial indirect population or employment growth.

For the reasons stated above, the Proposed Project would not have a cumulatively considerable contribution to any potential cumulative impact related to substantial increases in population, and its cumulative impact would be less than significant.

Housing

As identified in ABAG's *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*, the regional housing needs allocation for the nine-county Bay Area is 187,990 residential units, with San Francisco's share at 28,869 units. The Maximum Residential Scenario would provide approximately 3,025 new residential units, or 10.4 percent of the City's regional housing needs allocation and 1.6 percent of the total regional housing need. The Maximum Commercial Scenario would provide approximately 1,645 new residential units, or 5.7 percent of the City's

[83] ABAG, *Projections 2013*, p. 71.

[84] San Francisco County Priority Development Areas include Bayview/Hunters Point Shipyard/Candlestick Point; Balboa Park; Downtown-Van Ness-Geary; Eastern Neighborhoods; Mission Bay; Port of San Francisco; Transbay Terminal; Treasure Island; San Francisco/San Mateo Bi-County Area (with Brisbane); 19th Avenue Corridor; Market and Octavia; and Mission-San Jose Corridor.

regional housing needs allocation and 0.9 percent of the total regional housing need. As noted under "Housing Needs" on pp. 4.C.5-4.C.8, over the course of the past several decades construction of housing in the region has failed to keep pace with population growth in the Bay Area. Population growth is predicted to continue to grow at a relatively moderate rate through 2040, and the region is still attempting to make up for housing shortages from previous growth periods. The Proposed Project would help reduce the housing shortage and would not contribute to significant unplanned population growth.

The demand for 3,205 to 5,592 housing units that would be generated by employment under the Maximum Residential and Maximum Commercial Scenarios, respectively, would be more than the total number of units provided by the Proposed Project. However, the housing demand could be met with units developed under various Citywide and regional planning efforts, on-site development, and housing built as a result of the Jobs-Housing Linkage Fee. As a result, the Proposed Project's contribution to the substantial cumulative housing shortage in the Bay Area would be less than significant.

Housing Demand

The demand for housing units outside of the City generated by the Proposed Project, conservatively assuming that 27.3 percent of those employed within the project site would commute from outside of San Francisco, would be dispersed throughout the nine-county Bay Area. The Proposed Project would create a demand for housing in San Francisco in excess of the on-site residential development; however, anticipated household growth in adjacent PDAs (26,880), at the citywide level (101,539), and at the regional level (700,067) estimated in ABAG's *Projections 2013* could accommodate this additional demand. Therefore, the population growth associated with increased project-related employment would not result in a housing demand that would exceed planned regional housing development, and would not be substantial. Because the employment increase associated with the Proposed Project would not be individually substantial or contribute to an exceedance of the City's employment projections, the Proposed Project would not result in a cumulatively considerable contribution to a potentially significant cumulative impact related to employment. Cumulative impacts related to physical environmental topics (like transportation, noise, and air quality) are discussed in other sections of Chapter 4 in this EIR.

Employment

Development at the project site would provide about 5,599 (under the Maximum Residential Scenario) to 9,768 (under the Maximum Commercial Scenario) new permanent jobs by 2030 (in addition to temporary construction-related jobs generated by the Proposed Project). Regional projections indicate that by 2040 the San Francisco Bay Area will have about 4,505,230 jobs

(from 3,669,990 in 2015), an increase of 835,240 jobs. Citywide projections indicate that by 2040 San Francisco will have about 759,500 jobs (from 617,420 in 2015), an increase of 142,080 jobs.[85] The Proposed Project's contribution of 5,599 to 9,768 new permanent jobs would represent about 0.6 to 1.2 percent of the anticipated increase in regional employment and about 4 to 7 percent of the anticipated employment growth in San Francisco through 2040.

San Francisco has traditionally experienced, and will continue to experience, employment opportunities that are not met by an equal supply of housing within the City, or even the Bay Area. The demand for 3,205 to 5,592 housing units that would be generated by employment under the Maximum Residential Scenario and the Maximum Commercial Scenario, respectively, would be more than the total number of units provided by the Proposed Project. However, the housing demand could be met with units that could be developed under various Citywide and regional planning efforts and housing built as a result of the Jobs-Housing Linkage Fee. Therefore, the population growth associated with increased project-related employment would not result in housing demand that would exceed planned housing development, and would not be substantial. Because the employment increase associated with the Proposed Project would not be individually substantial or contribute to an exceedance of ABAG's employment projections for the City, the Proposed Project would not result in a cumulatively considerable contribution to a potentially significant cumulative impact related to employment.

[85] ABAG, *Projections 2013*, p. 74.

D. CULTURAL RESOURCES

Section 4.D, Cultural Resources, considers both archeological resources, tribal cultural resources, and historic architectural resources. Archeological resources are discussed first, followed by a separate discussion of historic architectural resources that begins on p. 4.D.33.

ARCHEOLOGICAL RESOURCES

This subsection assesses the potential for the presence of archeological resources within the project site, provides a context for evaluating the significance of archeological resources that may be encountered, evaluates the potential impacts (project and cumulative) of the Proposed Project on archeological resources, and provides mitigation measures that would avoid or reduce potential impacts on archeological resources.

An independent consultant has prepared an Archeological Research Design and Treatment Plan (ARDTP) for the project site.[1] The research and recommendations of the ARDTP are the basis for the information and conclusions of this EIR section with respect to archeological resources.

The information in the ARDTP used in the preparation of this subsection was obtained from regional databases, plans, and reports relevant to the Proposed Project, including the San Francisco Maritime National Historical Park photographic collection; the San Francisco History Center at the San Francisco Public Library; Sanborn Fire Insurance maps;[2] San Francisco newspapers; the California Digital Newspaper Collection, sponsored by the University of California, Riverside; the Online Archive of California; the Union Iron Works Historic District National Register Nomination Form; the Library of Congress; and the David Rumsey Map Collection, which also provided useful sources of online maps, including those from the U.S. Coast and Geodetic Survey, U.S. Geological Survey, and official City and County survey maps. Other relevant primary references include (but are not limited to) historic photographs and aerial images, City directories, U.S. Census data, and municipal reports.

[1] ESA, *Pier 70 Mixed-Use District Project, City and County of San Francisco, Archaeological Research Design and Treatment Plan,* June 2015.

[2] Sanborn Maps is an American publisher of maps of U.S. cities and towns. The maps were initially created to estimate fire insurance risks, and are now used as a record of roads and structures extant at the time.

ENVIRONMENTAL SETTING

PREHISTORIC AND HISTORIC CONTEXTS

The following discussion outlines the prehistoric context of the project site, based on relevant chronological prehistoric archeological sites on the San Francisco peninsula and in the San Francisco Bay Area.

Prehistoric Context

The oldest evidence of human occupation in San Francisco includes two isolated human skeletons discovered 45 years apart deep below City streets in marine deposits. In October 1969, fragmentary human bones were encountered during construction of the BART Civic Center Station in downtown San Francisco. Radiocarbon dating of associated organic material indicated the remains were nearly 5,000 years old. The skeleton was discovered 75 feet below ground surface within a 40-foot-thick clayey silt stratum (bay deposits), approximately 26 feet below mean sea level. More recently, an intact human skeleton was found during construction of the Transbay Transit Center in February 2014. The human remains were encountered at a depth of 58 feet below ground surface within a compressible marine clay known as Bay Mud deposits, and are estimated to be between 5,000 to 7,000 years old. The majority of known prehistoric sites in San Francisco are no more than 2,000 years old and were found buried at depths of approximately 10 to 20 feet below ground surface.

Near the southeastern shoreline of San Francisco, most of the prehistoric sites are shell midden sites, which have their greatest known concentrations in the South of Market neighborhood (north of the project site) and the Hunters Point-Bayview-Candlestick Point-Visitacion Valley area (south of the project site). A National Register-eligible district that incorporates several prehistoric sites is within sand dunes formed along the north side of historic Mission Bay, within the South of Market neighborhood approximately 1.5 miles north of the project site. These sites are considered to represent elements of a large prehistoric multi-village community. No prehistoric archeological sites have yet been encountered on the project site.

California prehistory consists of following periods: the Terminal Pleistocene period (11,500-9,600 B.C.), characterized by small and highly mobile populations of hunter-gatherers; the Early Holocene period (9600-5700 B.C.), characterized by semi-mobile hunter-gatherers who used flaked stone tools and ground stone implements; the Middle Holocene period (5700-1800 B.C.), characterized by substantial settlements, isolated burials, distinct cemeteries, milling slabs, mortars and pestles, and the fabrication and use of shell beads and other ornaments; and the late Holocene period (1800 B.C.-A.D. 1780), characterized by establishment of large shellmounds, exploitation of deer, sea otter, mussels, and clams (by the Yelamu Ohlone tribe in the San

Francisco peninsula), and brought to a close by disruption of the Mission system, disease, and displacement with European contact.

Historic Context

Spanish Period (1776-1820)

The historic period begins with the first European expedition into the San Francisco Bay Area in 1772 by Pedro Fages and his party. During the Spanish Period (1776-1820), the Spanish established Mission San Francisco de Asís (also known as Mission Dolores) in 1776 on land occupied seasonally by the Yelamu Ohlone. No permanent Ohlone or Spanish settlements were present in the vicinity of the project site during the Spanish Period. The Spanish missionaries used portions of what are now the Potrero Hill and Dogpatch neighborhoods, including the territory around the project site, as pasture for livestock known as Potrero Nuevo, or "new pasture."

Mexican Period (1821-1848)

During the Mexican Period (1821-1848), following the ceding of Spain's North American colonial outposts to the newly independent Republic of Mexico in 1822, Upper California became a province of the Republic of Mexico. In 1833–1834, the Mexican government secularized the Spanish missions, and many mission lands were also subsequently granted to wealthy and politically influential individuals who established vast cattle raising estates, or ranchos. During the Mexican period, Potrero Hill, including Potrero Point, became part of a large rancho known as Rancho Potrero de San Francisco, which was granted by the Mexican government to the sons of Francisco de Haro. Potrero Point is the geographical name for the eastern arm of the Potrero Hill natural landmass extending into San Francisco Bay. It includes those portions of the project site that are not on filled land, the Illinois Parcels and the southeastern area of the 28-Acre Site. The project site remained undeveloped throughout the 1840s. War between the United States and Mexico broke out in 1846. American attempts to seize control of California quickly ensued, and within two months California was taken by the United States. Skirmishes between the two sides continued until California was officially annexed to the United States on February 2, 1848.

Gold Rush Period (1849-1959)

The discovery of gold in the Sierra Nevada in 1848 began the Gold Rush Period (1849-1959). During this period, immigrants poured into the California territory seeking gold or associated opportunities. To accommodate the growing population, the City soon spread out in all directions. During the early Gold Rush period, the project site was located far beyond the sparsely populated southern edge of development that was concentrated to the north. The project site remained undeveloped throughout the 1850s, with the exception of a single structure in the

northern portion of the project site and a dirt track that traversed the southwestern corner. A powder magazine (a place used for artillery storage) along with several other structures and piers were present just south of the project site in 1859. In addition, the Tubbs Cordage Company's rope-making facility, which was established in the mid-1850s and included a 1,000-foot-long rope walk, was approximately 0.25 mile south of the project site. Historic maps and charts of San Francisco indicate that at the time of the Gold Rush and in the decade following, land reclamation off Potrero Point had not yet begun, and the eastern and northern portions of the project site were within San Francisco Bay.

Late Nineteenth Century (1860-1899)

In the late nineteenth century, development of the project site occurred at a steady pace. Industrial complexes were established in the northern and eastern portions of the project site, and residential and commercial neighborhoods were founded on Irish Hill in the southern and western portions, as described below.

INDUSTRIAL COMPLEXES

Little development took place around Mission Bay and San Francisco's southern waterfront before the mid-1860s, with only a limited amount of filling along the northern shores of Mission Bay. Further south, Potrero Point made an ideal manufacturing area for hazardous materials. The E. I. du Pont de Nemours Company was one of the first manufacturers to exploit this region, setting up a facility to manufacture black powder in 1854. Over the following decades, the Tubbs Cordage Company/San Francisco Cordage Manufactory, Pacific Rolling Mills, and City Gas Company Works moved to the Potrero district.

By the early 1860s, the City's early wooden shipbuilders abandoned the crowded shoreline along Steamboat Point in San Francisco's South of Market district for the deep waters and vacant lands around Potrero Point. In 1862, John North moved his shipbuilding operation from Steamboat Point to a location in Potrero Point immediately south of the Pacific Rolling Mills facility at the foot of present-day 22nd Street. This was the first shipyard established on Potrero Point. North's shipyard built a wide variety of vessels, but focused mostly on building wooden-hulled steamers for use in San Francisco Bay and inland waterways. The shipyard continued to operate at the same location until the 1890s.

Following the establishment of shipyards on Potrero Point in the early 1860s, development of the Pacific Rolling Mills Company began in 1866, and it operated at Potrero Point from 1868 until around 1900. The Pacific Rolling Mills, the first significant iron and steel mill in the West, produced machinery and specialized steel parts for the mining industry, construction, shipbuilding, and rail equipment.

By 1869, a network of roads crisscrossed the project site, with numerous structures dotting Potrero Point and several piers and a large wharf associated with Pacific Rolling Mills present on the waterfront along the eastern edge of the project site. Although some infilling along the shoreline had begun during the 1860s, the eastern and northern portions of the project site were still within San Francisco Bay at the end of the decade.

The Union Iron Works shipyard opened at Potrero Point in 1884 with a machine shop (Building 113), plate shop, pattern shop, foundry, smith shops, and slipways. The next year the yard launched the *Arago*, the first steel hull ship produced by Union Iron Works and launched on the West Coast, and one of the first steel hull ships completed in the country. In 1885, after the yard's success with the *Arago*, Union Iron Works secured naval contracts, initiating a relationship between the U.S. Navy and the yard that lasted through World War II. During the late nineteenth century, the shipyard completed some of the most famous warships of the Spanish-American War, including the USS *Oregon* and the USS *Olympia*.

The 1886 Sanborn map shows North's shipyard in the southeast corner of the project site; by that time North had sold his shipyard to new owners. The Sanborn map also shows the layout of the Pacific Rolling Mills in the northeast portion of the project site and a single "old" structure and two marine railways extending offshore from the base of the bluff. In addition, the map indicates that the former location of Henry Ewing's shipyard, near the present-day intersection of Illinois and 20th streets, had been filled between 1883 and 1886. By 1886, this location was covered with boardinghouses and other businesses that had proliferated on Irish Hill since the late 1860s.

IRISH HILL NEIGHBORHOOD, 1860-1885

When shipbuilders began to move from Steamboat Point to Potrero Point in the early 1860s, a significant residential labor force was attracted to the area. A large number of these workers were Irish immigrants, and the residential neighborhood that grew up around the industrial complex on Potrero Point became known as Irish Hill.

As industrial development of Potrero Point expanded, the number of boardinghouses and other businesses focused on serving working-class residents expanded as well. A large number of boardinghouses, cottages, and saloons were located along Illinois Street south of 20th Street as early as 1869. Although only sparse topographic information is included on the 1886 Sanborn map, it gives a detailed impression of the stark difference between the industrial complexes that occupied the level ground just above sea level and the residential and commercial neighborhood that surrounded them on the higher-elevation uplands of Irish Hill.

The 1870 census data confirms that residents of the project site included a high percentage of working-class immigrants whose jobs covered a wide range of primarily blue-collar occupations.

Although the area historically came to be known as Irish Hill, there were residents originating from countries other than Ireland as well, including the United States, England, Wales, various regions of what was to become Germany, Canada, Norway, Denmark, Sweden, and Australia. There were five Chinese residents who were young single males, aged 17-29, following that group's immigration pattern. Accounts of the North shipyard suggest that Chinese laborers may have been employed by the Potrero Point shipbuilders during the 1860s. Many of the area's residents were born in other parts of the U.S. and came west following the Gold Rush. The 1880 census did not list any Chinese residents. None of the residents from the 1869 directory still lived in the area by 1880.

Twentieth Century (1900-Present)

INDUSTRIAL COMPLEXES

The 1886 and 1900 Sanborn Maps indicate that, physically, relatively minor changes occurred in Potrero Point during that 14-year period. The 1900 Sanborn map indicates that the Pacific Rolling Mills facility expanded slightly to the west and included a machine shop, punching sheds, horseshoe storage, and offices. The Union Iron Works expanded its facility south between Michigan and Georgia streets for the extension of a spur rail line. In the southeast corner of the project site, North's shipyard, present on the 1886 Sanborn map, is no longer present on the 1900 Sanborn map; presumably, it had been removed by the expansion of the Pacific Rolling Mills facility. In 1900, the Risdon Iron & Locomotive Company acquired the Pacific Rolling Mills facility, and it operated on the same property from 1900 until 1911. Risdon produced mining equipment and developed some of the first and most successful gold dredgers.

In 1905, Charles Schwab purchased the shipyard on behalf of the Bethlehem Steel Corporation, the second largest steel manufacturer in the country. In the spring of 1908, Schwab personally oversaw upgrades to the yard's repair facilities, which allowed the yard to repair the Great White Fleet, the naval fleet that President Theodore Roosevelt ordered to sail around the world from 1907 to 1909 as a display of the country's growing military power.

By World War I, the Bethlehem Shipyard served as the headquarters of a West Coast shipbuilding complex, which included the Hunters Point Drydock, the Alameda Yard, and the U.S. Navy Destroyer Plant. New buildings designed by renowned San Francisco architects were constructed along 20th Street (outside of the project site), creating a grand entrance to the yard. The shipyard was expanded and modernized during the 1910s to include expanded infrastructure, a new plate shop (Building 109), and new foundries (Building 115/116). The 66 submarine destroyers produced by the yard made a substantial contribution to the World War I naval effort.

The yard survived the lean years after World War I on commercial ship construction and ship repair contracts. United States Maritime Commission contracts, starting in 1936, resulted in a new wave of modernization at the yard. Upgrades included a new boiler house (Building 103), a new steel warehouse (Building 117, located on the 28-Acre Site), and a yard-wide transformation from riveting to welding, which helped the yard adapt to standardized mass production that typified World War II ship production.

During the start of World War II, the shipyard was expanded to include new buildings and new and expanded slipways and wet basins along the waterfront. The shipyard was managed primarily by the U.S. Navy during the war. The most substantial development was the expansion of the southeastern slipways (Slipways 5 through 8, located on the waterfront on the 28-Acre Site) and construction of the New Yard shipbuilding facility (the Building 12 complex, also located on the 28-Acre Site), which was built by the Navy on the former destroyer plant in 1941. Building use became more specialized, with buildings designated and equipped for specific outfitting and ship repair activities. The repair yard, which contained structures and even equipment that dated back to the origins of steel shipbuilding in this country, was one of the best and the largest commercial repair yards in the country. During the war years, the yard built over 70 ships and repaired 2,500 others.

After World War II, the yard continued to build government and commercial ships into the 1970s. In the early 1980s, the Bethlehem Steel Company went bankrupt and sold the shipyard to the Port of San Francisco. Todd Shipyards purchased much of the machinery and leased portions of the yard for ship repair. Today, BAE Systems Ship Repair leases portions of the yard from the Port of San Francisco and continues to operate a ship repair facility on site, making the yard the longest operating steel hull ship repair yard in the country.

In 2014, the Potrero Point industrial complexes on Pier 70 were listed on the National Register Historic District as the Union Iron Works Historic District (see “Union Iron Works Historic District” in Chapter 2, Project Description, pp. 2.9-2.10). The Union Iron Works Historic District is a maritime industrial district that is historically significant at the national level for its association with the development of steel hull shipbuilding in the United States, including its pioneering technological developments in shipbuilding, and the production of significant wartime vessels. The Union Iron Works Historic District is also significant at the local level because it is a physical record of the trends in industrial architecture from the late nineteenth century through World War II.

IRISH HILL NEIGHBORHOOD, 1900-1914

The 1900 Federal census shows the working-class neighborhood of Irish Hill was not only in place at the turn of the century, but continued to attract new immigrants to the area. The dates of

immigration for the residents show that many of them had arrived between 1880 and 1900. San Francisco, including the Irish Hill neighborhood, which was dominated by industry as noted above, was a place of employment and possibility. Although there is a spattering of surnames, "Irish Hill" was just that, a place of work and residence for families from Ireland and other countries, as well as single boarders and servants.

Although the overall outline of Irish Hill did not change dramatically between 1900 and 1914, all residential housing between the Georgia and Maryland street alignments had been eradicated by 1914. The density of residential housing between the Illinois and Georgia street alignments had also decreased substantially. In addition, in the southwest corner of the project site, on much of the Illinois Parcels and the southwestern area of the 28-Acre Site, Irish Hill had been cut back between Illinois and Michigan streets and the boardinghouses there replaced by a large steel fuel oil tank operated by the Western Sugar Refining Company. Just a few years later, by the end of World War I, all residential housing on Irish Hill had been removed.

PRIOR GROUND DISTURBANCE WITHIN THE PROJECT SITE

Establishing industrial operations within the project site involved extensive alteration of the native Potrero Point landform, including substantial cutting and filling. The gently sloping hillside of Irish Hill depicted on the 1859 U.S. Coast Survey chart was gradually leveled and the shoreline was altered through land reclamation. This process of cutting and filling to expand the industrial facilities continued throughout the late nineteenth century and into the twentieth century up to World War II.

The northwest portion of the project site (the northern part of 20th/Illinois Parcel in the Illinois Parcel site) once straddled the Potrero Point shoreline where it transitioned from an east-west to a north-south orientation. The area became reclaimed land when the shoreline and offshore tidelands were artificially filled beginning in the late 1860s, a process that was complete by 1886. After land reclamation, this location became a vibrant and thriving part of the Irish Hill community, and it remained so through the 1910s. Bethlehem Steel established offices there in the 1920s (Buildings 39 and 54, at the southeast corner of Illinois and 20th streets).

Although no precise nineteenth century topographic data are available for Irish Hill, early topographic renderings of the project site indicate that it originally extended to a height of approximately 100 feet above sea level. Gradual expansion of the adjacent industrial complexes reduced the overall footprint of Irish Hill over the course of the late nineteenth and early twentieth centuries.

Sometime between production of the 1914 Sanborn map and the 1938 Ryker aerial image, major excavations removed the majority of the upper surface of Irish Hill, reducing it to its current

elevation of 35 feet above sea level. A more severe geographic truncation of Irish Hill occurred during construction of the New Yard/Building 12 complex in 1941. Approximately 550 linear feet of Irish Hill were removed, including the entire eastern portion of the hill, west to its current extent. This construction event brought the entire eastern portion of Irish Hill down to the same grade as the remainder of the industrial complex, approximately 12 feet above sea level. Geotechnical investigation confirms that the area immediately east of the Building 12 complex and west of the slipways is shallow (2 to 3 feet) fill over bedrock. In addition to the construction of the Building 12 complex, the construction of Slipways 5 through 8 in 1941 was also a destructive process that severely impacted the landform on the 28-Acre Site.

Today, the project site's eastern portion (comprising a majority of the 28-Acre Site) and northwestern portion (roughly, the northern portion of the 20th/Illinois Parcel) are underlain by fill, consisting of locally quarried rock, sand, and clay with wood, slag, concrete, and brick debris. The fill layer is shallower upland to the west and becomes deeper towards the Bay to the east (up to 37 feet below ground surface). The fill layer is underlain by Bay Mud (from 2 to 40 feet thick), which is underlain by stiff clay and dense sand over bedrock. The southwestern portion of the project site (roughly, the southern portion of the 20th/Illinois Parcel and the Hoedown Yard) is underlain at grade by serpentine bedrock of the Franciscan Complex with localized pockets of fill. In the northeastern portion of the Illinois Parcels (the northwestern portion of the overall project site), weak Bay Mud is located below the fill, ranging in thickness from 2 to 6 feet; the Bay Mud generally increases in thickness toward the east, and is typically underlain by stiff clay and dense sand over bedrock.

ARCHEOLOGICAL RESOURCES THAT MAY BE PRESENT WITHIN THE PROJECT SITE

No prehistoric archeological sites have been recorded within a one-half-mile radius of the project site. The project site consists of surface or shallow bedrock in the western portion of the project site and fill over Bay Mud in the eastern and northern portions of the project site. As described under "Prior Ground Disturbance within the Project Site" on pp. 4.D.8-4.D.9, the entire project site has undergone massive land transformation during the late nineteenth and early twentieth centuries that is likely to have removed any traces of prehistoric surface deposits on the project site. Artificial fill overlaying Bay Mud and bedrock has a low potential for containing significant prehistoric archeological resources. For this reason, the focus of the remainder of this subsection is on historical property types.[3]

[3] Note, however, that the presence of prehistoric archeological resources within the project site cannot be conclusively ruled out. The ARDTP includes information about prehistoric archeological property types, as well as prehistoric research themes and questions, to provide a basis for study, evaluation and treatment of prehistoric archeological resources in the event that they are encountered during project construction.

Historical archeological sites qualify as CEQA "historical resources" if they are determined to be eligible for listing on the California Register of Historic Resources (CRHR). Archeological resources associated with the Union Iron Works Historic District discovered during project-related ground disturbance may be determined to be historical resources under CEQA. In this case, archeological resources within the project area may be considered eligible for listing on the CRHR and therefore qualify as CEQA historical resources if they are related to contributing elements of the Union Iron Works Historic District even if they are not considered significant for their data potential.

To be considered eligible to the CRHR, resources must possess physical integrity as well as integrity of setting. Historical archeological resources are typically evaluated relative to their ability to meet Criterion 4 of the CRHR, which states that the site has yielded, or may be likely to yield, information important in prehistory or history (California Code of Regulations 15064.6). An archeological resource may also be CRHR-eligible under Criterion 1, association with events that have made a significant contribution to the broad patterns of history; Criterion 2, association with the lives of historically important persons; or Criterion 3, association with the distinctive characteristics of a type, period, region, or method of construction.

Listed below are archeological resources that may be present within the project site based on the known historic activities at the project site. Research themes and questions are also presented to provide the basis for evaluating the information potential of features that may be encountered during construction under CRHR Criterion 4.

Subsurface Architectural Features

Subsurface architectural features include structural remains such as foundations, wall footings, basement walls, and floor remnants. This property type encompasses a wide variety of buildings and other structures. Within the project site, there is the potential to encounter subsurface architectural features from a variety of buildings in the former Union Iron Works/Bethlehem Steel industrial complex that have been demolished or removed over time. Demolition and excavation activities in the southeast portion of the project site will likely encounter the remains of Slipways 5 through 8, which are buried under modern fill and asphalt. Locations on the former, nineteenth century shoreline that have not been severely impacted by later development may contain buried features associated with shipbuilding or other maritime activities.

In many cases, architectural remains correlate with buildings and structures depicted on maps of the City, photographs, and other documents. When that occurs, the ability of those remains to contribute to important research themes may be limited, especially for later nineteenth and early twentieth century features, because it does not reveal any new information not already available in the documentary record.

Landscape Features

Landscape features in the archeological record are often ephemeral resources, such as fence lines and ditches, but they may give evidence of historic land uses. More substantial landscape features may include elements such as stone walls and aqueducts. While historic maps are critical to an understanding of landscape evolution, the research potential for landscape features varies and often depends on what is understood about historic land use from the documentary record. There is an unknown potential for encountering landscape features in the project site.

Infrastructure Features

Infrastructure includes those features related to development and maintenance of the City of San Francisco, such as roads, cisterns, sewer lines, drain pipes, power lines, water lines, and hydrants. Infrastructure features often correlate to utility maps and the locations of architectural features such as buildings. Identification of these physical features is critical for anticipating potential project impacts on archeological resources, although the documentary record may already convey much historic information about the City's infrastructural development.

Infrastructure features most likely to be encountered within the project site would be associated with the former Union Iron Works/Bethlehem Steel industrial complex and the industrial activities that took place on the property. Utilities such as electrical lines, and hydraulic and pneumatic systems associated with steel shipbuilding, may be encountered throughout the former industrial complexes in the project site. In addition, a variety of rail spurs were installed throughout the complexes, and the location and configuration of these spurs has changed over the decades. Remnants of rail spurs from a number of different eras may be encountered during implementation of the Proposed Project. Finally, paving stones from streets within the complex may be encountered archeologically. The Union Iron Works Historic District National Register Nomination Form specifies that 20th Street paving stones are a non-contributing resource; however, additional paving stones encountered during project implementation should be evaluated separately.

Refuse Features

Refuse features that result from domestic and economic use of an area have proven to be one of the most useful sources of historical archeological investigation in urban settings. Two primary types of refuse features are recognized in archeological practice. Hollow-filled refuse features include refuse pits, privies, and wells. Discrete refuse features provide archeologists with a glimpse of the day-to-day practices of the occupants who used them. As such, these features frequently have the ability to address important research themes. Hollow-filled refuse features are commonly associated with late nineteenth century dwellings that were present in San

Francisco neighborhoods before later structures were built, and they are often the target of archeological testing programs.

Sheet refuse features (i.e., a layer or scatter of artifacts deposited on the ground's surface rather than in a hollow feature such as a pit, privy, or well) include broad artifact scatters as well as more ephemeral surface scatters that are often indicative of more extensive archeological deposits located beneath the surface. Sheet refuse often accumulates over a period of time. It may also be introduced as fill to raise low ground. The long time it may take to accumulate sheet refuse features can be problematic for archeologists, depending on the occupation history of the location under review. It may be difficult to draw conclusions from a sparse sheet refuse layer deposited over many years by several occupants.

The project site has the potential to contain refuse features associated with residences in the former areas of Irish Hill, as well as industrial refuse associated with the Union Iron Works/Bethlehem Steel complex or former shipyards. Refuse features could provide insights into the domestic and economic use of the project area and would be a useful archeological source.

Industrial Features

Industrial features are unique to industrial and manufacturing sectors such as the Pier 70 project site. Diverse industrial activities have taken place in the project site since development began there in the 1860s, including wooden shipbuilding; iron and steel manufacturing; engine, boiler, locomotive, and mining equipment construction; and steel-hull shipbuilding and repair. These industries may have left subsurface traces as each phase of expansion, modernization, and revitalization that took place on the project site. These features may be in primary or secondary contexts, and the significance of individual features would depend on integrity and potentially their relationship with contributing elements of the Union Iron Works Historic District.

HISTORICAL RESEARCH THEMES

The ARDTP identifies questions that may be addressed by the types of resources and kinds of data that the project site has the potential to contain. The research themes discussed below – consumer behavior, social status and identity, wharf and pier construction, land reclamation, and industrialization and technology – can be addressed only by using data from the archeological record (often in conjunction with the documentary record) rather than data from other sources such as archival records. The purpose of identifying the relevant research themes here is to help predict areas of special concern within the project site, given the property types that might reasonably be present. The significance of archeological remains encountered during testing or implementation of the Proposed Project would be considered in light of these themes.

Consumer Behavior

Historical material culture located within discrete hollow or sheet refuse features in former residential areas of Irish Hill may indicate the consumer behavior of residents of the project site. Objects discarded or lost in refuse deposits may illustrate the changes in both choice and utility of various nineteenth and twentieth century consumer goods. Discarded objects are an indicator of the availability of particular goods to residents of a household or neighborhood, or to business owners or employees. Consumer choice goes beyond simple availability of goods; consumer behavior can be linked to the expression of identity by both socioeconomic and ethnic groups. San Francisco's immigrant neighborhoods and the households comprising them had access to a wide array of consumer goods, and the choices individual residents or business owners or employees made in selecting goods can give insight into a variety of cultural processes that influence consumer choice.

There may be sheet refuse or hollow features associated with residential use of the project site. A variety of working class occupants lived in the boardinghouses and flats on the project site. Refuse features located in the project site would likely reflect consumption patterns of the residents and may augment current understanding of their cultural practices and daily lives. Refuse features may also represent broader consumption patterns about the community or society as a whole.

Social Status and Identity

Immigrant neighborhoods, such as San Francisco's late nineteenth century Irish Hill neighborhood, provide a unique opportunity for examining how individuals and families represent and portray their social identity and socioeconomic status. Using the historical record, including City directories and census data, researchers can identify basic information about an individual or family's identity and socioeconomic status; using the archeological record, researchers can investigate how an individual or family materially expressed their identity. Material remains on the project site would likely reflect the particular social and ethnic backgrounds of former residents of Irish Hill. Archeological deposits from households with mixed socioeconomic classes may indicate that different families experienced the neighborhood in different ways. In addition, boardinghouses, such as those on Irish Hill, can leave different signatures than family-related deposits in the archeological record.

Wharf and Pier Construction

Remnants of wharf and pier construction may be found on the project site. After the City's economic involvement with the Gold Rush faded, City residents began to explore other means of economic growth. Transportation, especially by water, became critical. Construction of wharves

and associated docks was an early competition in the rapidly growing San Francisco shoreline areas. Historic maps of the project site indicate that shipyards in the northwest and southeast portions of the project site had wharfs, which may be preserved within or beneath artificial fill.

If wharf, pier, or dock resources exist within the project site, their primary research value is likely related to the technology involved in their construction. Themes of potential research would include construction of the wharf (pilings, cribs, or other features), techniques used in the construction typical of their time and locale, and the potential for local (unique to San Francisco) innovation in wharf construction.

Land Reclamation

Local environmental, economic, and historical developments led to the creation of new land in the project site. In order to create this land, the overall landscape had to first be envisioned and then reworked to meet local needs over time. During the twentieth century, when mechanization and technology allowed for more expansive reclamation, filling events were more deliberate and covered a larger area. Within the project site, systematic removal of most of Irish Hill resulted in spoil used to create new lands to the east; beginning in 1941, the U.S. Navy used these lands to expand the shipyard. Encountering archeological features related to the land reclamation process, such as landfill retaining structures, during implementation of the Proposed Project may lead to a more comprehensive understanding of how land reclamation was accomplished and developed over time.

Industrialization and Technology

The archeological record is an important source of information on technological development that is often absent from the documentary record. Archeological remains associated with any of the various industrial facilities that operated within the project site may be encountered during implementation of the Proposed Project (including shipyards operated by John North and Henry Ewing in the early 1860's; the Pacific Rolling Mills Company, which operated from 1868, and its successors; and the Union Iron Works, which operated from around 1884, and its successors). It is likely that foundries, boiler shops, and shipbuilding activities left deposits that may give insight into industrial processes and technologies. These could include evidence of what production activities were carried out in relation to other activities, workplace conditions, what materials and products were consumed, and what waste products were produced. The potential also exists for specific features to be historically significant and therefore qualify as a CEQA historical resource based on their association with the Union Iron Works Historic District.

REGULATORY FRAMEWORK

Under CEQA, archeological resources are considered to be part of the physical environment; thus, CEQA requires that projects be analyzed for their potential to adversely affect archeological resources (CEQA Section 21083.2). For projects that may have an adverse effect on a significant archeological resource, CEQA requires preparation of an EIR (CEQA Section 21083.2 and CEQA Guidelines Section 15065). CEQA recognizes two different categories of significant archeological resources: "unique" archeological resources (CEQA Section 21083.2) and archeological resources that qualify as "historical resources" under CEQA (CEQA Section 21084.1; CEQA Guidelines Section 15064.5). Assembly Bill 52 (AB 52) (Chapter 532, Statutes of 2014), effective July 1, 2015, amends CEQA by adding Public Resources Code Section 21704, which establishes a new category of cultural resources to be considered under CEQA, called "tribal cultural resources." AB 52 also amends CEQA by adding Section 21080.3.1, which establishes a new procedure for notification and consultation with California Native American tribes that are culturally affiliated with the geographic area of the proposed project.

DEFINING ARCHEOLOGICAL RESOURCES

An archeological resource can be significant as either a "unique" archeological resource or an "historical resource" or both, but the process by which the resource is identified under CEQA as one or the other is distinct (CEQA Section 21083.2(g); CEQA Guidelines 15064.5(a)).

An archeological resource is an historical resource under CEQA if the resource is:

- Listed on or determined eligible for listing on the CRHR; this includes archeological properties listed or eligible for the NRHP;
- Listed in a "local register of historical resources";[4] or
- Listed in an "historical resource survey."

Generally, an archeological resource is determined to be an historical resource due to its eligibility for listing to the CRHR or the NRHP under Criterion 4 because of its potential scientific value; that is, it "has yielded, or may be likely to yield, information important in prehistory or history" (CEQA Guidelines Section 15064.5(a)(3)). An archeological resource may also be CRHR-eligible under other evaluation criteria, such as Criterion 1, association with events that have made a significant contribution to the broad patterns of history; Criterion 2, association with the lives of historically important persons; or Criterion 3, association with the distinctive characteristics of a type, period, region, or method of construction. Appropriate treatment for archeological properties that are CRHR-eligible under criteria other than Criterion 4 may be

[4] A local register of historical resources is a list of historical or archeological properties officially adopted by ordinance or resolution by a local government (Public Resources Code 5020.1(k)).

different than treatment for a resource that is significant exclusively for its scientific value. Appropriate treatment for archeological resources significant under Criterion 1 (Events), Criterion 2 (Persons), and Criterion 3 (Design/Construction) may include an interpretive program to preserve and enhance the ability of an archeological resource to convey its association with historic events and persons and to convey its distinctive design/construction characteristics.

Failure of an archeological resource to be listed in any of these historical inventories is not sufficient to conclude that the archeological resource is not an historical resource. When the lead agency believes there may be grounds for a determination that an archeological resource is an historical resource, then the lead agency should evaluate the resource for eligibility for listing on the CRHR (CEQA Guidelines Section 15064.5(a)(4)).

"Unique archaeological resource" is a category of archeological resources created by the CEQA statutes (CEQA Section 21083.2(g)). An archeological resource is a unique archeological resource if it meets any one of the following three criteria:

- Contains information needed to answer important scientific research questions (and there is a demonstrable public interest in that information);
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Under CEQA, evaluation of an archeological resource as an historical resource is privileged over the evaluation of the resource as a unique archeological resource in that CEQA requires that "when a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource" (CEQA Guidelines Section 15064.5(c)(l)).

Evaluation of an Archeological Resource as Scientifically Significant

In requiring that a potentially affected archeological resource be evaluated as an historical resource – that is, as an archeological site of sufficient scientific value to be CRHR-eligible – CEQA presupposes that the published guidance of the California Office of Historic Preservation (OHP) for CEQA providers will serve as the methodological standard by which the scientific, and thus the CRHR eligibility, of an archeological resource is to be evaluated. As guidance for the evaluation of the scientific value of an archeological resource, the OHP has issued two guidelines: *Archaeological Resource Management Reports* (1989) and the *Guidelines for Archaeological Research Designs* (1991).

Integrity of Archeological Resource

Integrity is an essential criterion in determining if a potential resource, including an archeological resource, is an historical resource. In terms of CEQA, "integrity" can, in part, be expressed in the requirement that an historical resource must retain "the physical characteristics that convey its historical significance" (CEQA Guidelines Section 15064.5(b)).

For an archeological resource that is evaluated for CRHR eligibility under Evaluation Criterion 4, "has yielded or may be likely to yield information important to prehistory or history," the word "integrity" has a different meaning from the way in which it usually applies to the built environment. For an historic building, possessing integrity means that the building retains the defining characteristics from the period of significance of the building. In archeology, an archeological deposit or feature may have undergone substantial physical change from the time of its deposition, but it may yet have sufficient integrity to qualify as a historical resource. The integrity test for an archeological resource is whether the resource can yield sufficient data (in type, quantity, quality, or diagnosticity) to address significant research questions. Thus, in archeology "integrity" is often closely associated with the development of a research design that identifies the types of physical characteristics ("data needs") that must be present in the archeological resource and its physical context to adequately address research questions appropriate to the archeological resource.

Significant Adverse Effect on an Archeological Resource

The determination of whether an effect on an archeological resource is significant depends on the effect of the project on those characteristics of the archeological resource that make the archeological resource significant. For an archeological resource that is an historical resource because of its prehistoric or historical information value, that is, its scientific data, a significant effect is impairment of the potential information value of the resource.

The depositional context of an archeological resource, especially soils stratigraphy (the characteristics of soil layers), can be contextually important to the resource in terms of dating and reconstructing its characteristics at the time of deposition and to interpreting the impacts of later deposition events on the resource. Thus, for an archeological resource eligible to the CRHR under Criterion 4, a significant adverse effect to its significance may not be limited to impacts on the artifactual material but may include effects on the soils matrix in which the artifactual material is situated.

Mitigation of Adverse Effect on Archeological Resources

Preservation in place is the preferred treatment of an archeological resource (CEQA Section 21083.2(b); CEQA Guidelines Section 15126.4(b)(3)(a)). When preservation in place of an

archeological resource is not feasible, data recovery, in accord with a data recovery plan prepared and adopted by the lead agency prior to any soils disturbance, is the appropriate mitigation (CEQA Guidelines Section 15126.4(b)(3)(C)). In addition to data recovery, under CEQA, the mitigation of effects to an archeological resource that is significant for its scientific value requires curation of the recovered scientifically significant data in an appropriate curation facility (CEQA Guidelines Section 15126.4(b)(3)(C)) that is compliant with the OHP's *Guidelines for the Curation of Archaeological Collections* (1993).

To the extent that the significance of archeological resources encountered within the project site may be premised on CRHR Criterion 1 (Events), and/or 3 (Design/Construction) (archeological resources significant under Criterion 2 (Persons) are not anticipated), a program for interpretation and display of such artifacts would preserve and enhance the ability of such resources to convey their association with the site and to their significance under these criteria.

Final studies reporting the interpretation, results, and analysis of data recovered from the archeological site are to be deposited in the California Historical Resources Regional Information Center (CEQA Guidelines Section 15126.4(b)(3)(C)).

Effects on Human Remains

Under State law, human remains and associated burial items may be significant resources in two ways. They may be significant to descendent communities for patrimonial, cultural, lineage, and religious reasons. Human remains may also be important to the scientific community, such as prehistorians, epidemiologists, and physical anthropologists. The specific stake of some descendent groups in ancestral burials is a matter of law for some groups, such as Native Americans (CEQA Guidelines Section 15064.5(d); Public Resources Code Section 5097.98). CEQA and other State regulations concerning Native American human remains provide the procedural requirements to assist in avoiding potential adverse effects to human remains within the contexts of their value to both descendent communities and the scientific community.

Effects on Tribal Cultural Resources

AB 52, effective July 1, 2105, amends the CEQA statute to identify a new category of resource to be considered under CEQA, called "tribal cultural resources." It amends the Public Resources Code to add Section 21074, which defines "tribal cultural resources," as follows:

(a) "Tribal cultural resources" are either of the following:

  (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

    A) Included or determined to be eligible for inclusion in the CRHR.

B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 adds Public Resource Code Section 21080.3.1, which establishes a new procedure for notification and consultation with a California Native American tribes that are culturally affiliated with the geographic area of the Proposed Project:

(d) Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

(e) The lead agency shall begin the consultation process within 30 days of receiving a California Native American tribe's request for consultation.

AB 52 adds Public Resource Code Section 21080.3.2(a), which provides,

> As a part of the consultation the parties may propose mitigation measures capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to a tribal cultural resource. If the California Native American tribe requests consultation regarding alternatives to the project, recommended mitigation measures, or significant effects, the consultation shall include those topics. The consultation may include discussion concerning the type of environmental review necessary, the significance of tribal cultural resources, the significance of the project's impacts on the tribal cultural resources, and, if necessary, project alternatives or the appropriate measures for preservation or mitigation that the California Native American tribe may recommended to the lead agency.

AB 52 Section 11(c) states, "This act shall apply only to a project that has a notice of preparation or a notice of negative declaration or mitigated negative declaration filed on or after July 1, 2015." As such, AB 52 does not apply to the Proposed Project, for which a Notice of Preparation was filed with the State Clearinghouse on May 6, 2015. Note, however, that the San Francisco Planning Department, in response to AB 52, has recently updated its CEQA Checklist to require evaluation of impacts on Tribal Cultural Resources. This updated San Francisco Planning Department CEQA Checklist has been used to evaluate impacts on Tribal Cultural Resources in this EIR.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact related to archeological resources. Implementation of the Proposed Project would have a significant effect related to archeological resources if the project would:

D.1 Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code;

D.2 Cause a substantial adverse change in the significance of an archeological resource pursuant to Section 15064.5;

D.3 Disturb any human remains, including those interred outside of formal cemeteries; or

D.4 Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074.

Project impacts related to the potential for substantial adverse change in the significance of historic architectural resources (Significance Threshold D.1) are discussed below, under "Historic Architectural Resources," beginning on p. 4.D.33.

APPROACH TO ANALYSIS

This Archeological Resources section is based on background information provided in the ARDTP.

Archival Research

The ARDTP compiled a list of primary (especially historic-era maps) and secondary source material to research the historical context and the land use history for the project site. The historic data compiled in the site history and general context provide information in support of possible mitigation measures.

Historic maps were used to identify the changing Pier 70 landscape over time. Nautical charts from the U.S. Coast Survey (later the U.S. Coast and Geodetic Survey) and topographic maps from the U.S. Geological Survey were used to plot the changing Potrero Point shoreline and topography over the decades. Sanborn Fire Insurance maps and the high-resolution 1938 aerial photographs by Harrison Ryker were used to trace the expansion of the Potrero Point industrial

complexes, including the Union Iron Works, Pacific Rolling Mills, and, later, Bethlehem Steel. These sources were also consulted in regard to the topographic changes to Irish Hill over time.

Secondary sources, including the Union Iron Works Historic District National Register Nomination, provided a framework for targeted research and an understanding of past historic-era land use.

Geotechnical Data

Geotechnical investigations conducted within the project site were studied to determine the presence or absence of subsurface strata with the potential to preserve buried prehistoric and historical archeological resources.[5]

Native American Consultation

On March 19, 2015, Native American Heritage Commission (NAHC) letters were sent to request information on known Native American sacred lands within the project site and a listing of individuals or groups with a cultural affiliation to the project site. A response was received from the NAHC on April 27, 2015, noting, "A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area." The NAHC letter also provided a list of Native American individuals who may have knowledge about such cultural resources. On May 13, 2015, letters were sent to the nine individuals on the list. The letters provided a description of the project and project site maps, and solicited input and comment regarding their knowledge about sacred sites or traditional lands within the project site; no responses were received.[6]

As discussed above in "Effects on Tribal Cultural Resources" on pp. 4.D.18-4.D.19, the noticing and tribal consultation requirements of AB 52 (codified in Public Resources Code Section 21080.3) do not apply to the Proposed Project, for which a Notice of Preparation was filed with the State Clearinghouse on May 6, 2015, before enactment of AB 52.

Analysis of Scenarios

Those features of the Pier 70 Mixed-Use District Project that could have an effect on archeological resources, particularly the location, depth, and area of ground disturbance within the project site, as described below under "Project Features," are the same or substantially similar

[5] Treadwell & Rollo, *Preliminary Geotechnical Investigation, Pier 70, San Francisco, California*. Prepared for Forest City Development, 2012; and Treadwell & Rollo, *Preliminary Geotechnical Evaluation, Pier 70-Illinois/20th Street and Hoe Down Yard, San Francisco, California*, February 23, 2015.

[6] Matthew A. Russell, ESA, letter to Allison Vanderslice, San Francisco Planning Department, Re: Pier 70 Mixed-Use Project Native American Heritage Commission Contacts, November 5, 2015.

under the Maximum Commercial Scenario and the Maximum Residential Scenario, the three options for sewer/wastewater treatment, and the three options for grading around Building 12 that are analyzed in this EIR. To the extent that these features may differ somewhat from one to another, they are generally included and accounted for in an analysis of maximum ground disturbance within the project site. The same archeological regulatory requirements and mitigation measures applicable to the Proposed Project are equally applicable under the Proposed Project's scenarios and options. Therefore, this analysis of impacts on archeological resources applies to both scenarios and no separate analysis of impacts under each scenario or option is necessary.

PROJECT FEATURES

This section describes aspects of the Proposed Project that would cause ground disturbance within the project site under both scenarios.

Demolition

Buildings 11, 15, 16, 19, 25, 32, and 66, and portions of Slipways 5 through 8 would be demolished to construct the Proposed Project.[7] Demolition of the buildings would entail some ground disturbance to remove subsurface foundations. Partial demolition of Slipways 5 through 8, which are currently buried beneath approximately 6 to 7 feet of modern fill and asphalt, would involve substantial ground disturbance.

Grading and Excavation

The Proposed Project would involve excavation of soils for grading and construction of the 15- to 27-foot-deep basements planned on most of the parcels. The excavation plan indicates a total of nine separate areas of the Proposed Project (mostly in the 28-Acre Site) that would be excavated to a depth of 15 feet below ground surface, and two areas, closer to the Illinois Parcels, that would be excavated to a depth of 27 feet below ground surface. Construction of the anticipated new 20th Street pump station northeast of the project site, adjacent to Building 6 on the BAE Systems Ship Repair site, would also result in excavation to a depth of approximately 20 feet below ground surface. In addition, grading to open the new 21st Street alignment, extending east from Illinois Street, would potentially involve grading through the northernmost extent of the 35-foot-tall remnant of Irish Hill. The Proposed Project would raise the grade of the 28-Acre Site and low-lying portions of the Illinois Parcels by adding up to 5 feet of fill in order to help protect

[7] While Building 117 is located within the project site boundary, the Port has decided to demolish Building 117 prior to approval of the Proposed Project. The Port filed an application to demolish Building 117 on January 7, 2016, Case No. 2016-000346ENV. Any approval of demolition of Building 117 would undergo appropriate environmental review, as required by CEQA, and its demolition is analyzed as a cumulative project in this EIR.

against flooding and projected future sea level rise. The rehabilitation of existing Building 12 would be done under one of three grading options: raising the exterior grade, raising the exterior and interior grade, or raising the structural frame.

Geotechnical Stabilization

To address the potential hazard of liquefaction and lateral spreading that may occur during a major earthquake, the Proposed Project would include measures to reinforce the existing slope with a structural wall or ground improvements along the northeastern and southeastern portions of the project site (north and south of the Slipway structures). Structural wall solutions may include, but are not limited to, tied-back sheet pile walls (interlocking sheets of steel), rows of secant piles (interlocking piles), and king-pile walls (wider piles connected by sheeting). Ground improvements may consist of treatments such as deep soil mixing to add a cement slurry to strengthen the existing soil or vibratory methods such as vibro-compaction, vibro-replacement, and dynamic compaction to densify and strengthen the existing soil.

Utilities

Potable and Recycled Water

Potable and recycled water distribution piping would be constructed in trenches under the planned streets to carry water for drinking and firefighting needs. Connections to the existing water mains underneath 20th Street, Illinois Street, and 22nd Street would be made at the intersections of Illinois Street/22nd Street, Illinois Street/21st Street (a new street), and approximately midway along the project boundary at 20th Street.[8] If necessary, the water main underneath the western portion of 20th Street would be replaced.

Proposed Wastewater (Sewer) and Stormwater Treatment

The project sponsors anticipate retaining much of the existing combined sewer system that serves areas outside of the project site, where such continued use is acceptable to the SFPUC. The SFPUC's 20th Street pump station would be replaced as part of the Proposed Project. To handle increased sewage and wastewater flows from the Proposed Project's anticipated development, the project sponsors propose to construct new wastewater and stormwater infrastructure in trenches under the Proposed Project's roadway and open space network and connect it to an outfall structure, under one of three sewer and wastewater options.

[8] BKF, Pier 70, Proposed Utilities, Low Pressure Water System diagram, February 26, 2015.

Electricity and Natural Gas

The Proposed Project would replace overhead electrical distribution with a joint trench distribution system following the proposed roadway layout. The existing natural gas distribution system would be extended to cover the entire project site, and the piping would be realigned within the proposed roadway network to serve the project site.

IMPACT EVALUATION

Impact CR-1: Construction activities for the Proposed Project would cause a substantial adverse change in the significance of archeological resources, if such resources are present within the project site. ***(Less than Significant with Mitigation)***

Under the Proposed Project, soils would be excavated for grading and construction of the 15- to 27-foot-deep basements planned on most of the parcels. In addition, construction of the anticipated new 20th Street pump station northeast of the project site, adjacent to Building 6 on the BAE Systems Ship Repair site, would also result in excavation to a depth of approximately 20 feet below ground surface. The Proposed Project would result in a net export total of about 340,000 cubic yards of soil. Construction activities, in particular grading and excavation, could disturb archeological resources potentially located at the project site.

As described under "Prior Ground Disturbance within the Project Site" on pp. 4.D.8-4.D.9, the entire project site has undergone massive land transformation during the late nineteenth and early twentieth centuries that would likely have removed any traces of prehistoric surface deposits. Artificial fill overlaying Bay Mud and bedrock has a low potential to contain significant prehistoric archeological resources; however, the presence of prehistoric archeological resources within the project site cannot be conclusively ruled out. Historical archeological sites relating to former industrial and residential activities that could be encountered at the project site include subsurface architectural features, landscape features, infrastructure features, refuse features, and industrial features, as described above on pp. 4.D.10-4.D.12.

To the extent that archeological resources potentially present within the project site may be associated with the Union Iron Works National Register Historic District, their significance would also be premised on NRHP Criteria A (Events) and C (Architecture/Construction) and the corresponding CRHR Criterion 1 (Events) and Criterion 3 (Architecture/Construction). Data recovery or documentation alone would be inadequate to mitigate such impacts. Additional mitigation measures, such as an interpretive program, would need to be implemented. The definition of an interpretive program can be found in Mitigation Measure M-CR-1b: Interpretation, on pp. 4.D.29-4.D.30.

Unless mitigated, ground-disturbing construction activity within the project site, particularly within previously undisturbed soils, could adversely affect the significance of archeological resources under CRHR Criterion 4 (Information Potential) by impairing the ability of such resources to convey important scientific and historical information. This effect would be considered a substantial adverse change in the significance of an historical resource and would therefore be a potentially significant impact under CEQA.

Mitigation Measure M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting, presented below, calls for a qualified archeological consultant to prepare and submit a plan for pre-construction archeological testing, construction monitoring, and data recovery for approval by the San Francisco Environmental Review Officer (ERO).

Mitigation Measure M-CR-1b: Interpretation, pp. 4.D.29-4.D.30, calls for a qualified archeological consultant to prepare and submit a plan for post-recovery interpretation of resources. Implementation of an approved program of interpretation under Mitigation Measure M-CR-1b would preserve and enhance the ability of the resource to convey its significance under CRHR Criterion 1 (Events), Criterion 2 (People), and Criterion 3 (Architecture/Construction).

Mitigation Measure M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting

Based on a reasonable presumption that archeological resources may be present within the project site, the following measures shall be undertaken to avoid any potentially significant adverse effect from the Proposed Project on buried or submerged historical resources. The project sponsors shall retain the services of an archeological consultant from rotational Department Qualified Archeological Consultants List (QACL) maintained by the Planning Department archeologist. The project sponsor shall contact the Department archeologist to obtain the names and contact information for the next three archeological consultants on the QACL. The archeological consultant shall undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required pursuant to this measure. The archeological consultant's work shall be conducted in accordance with this measure at the direction of the Environmental Review Officer (ERO). All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO. Archeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines Sect. 15064.5 (a) and (c).

Consultation with Descendant Communities

On discovery of an archeological site[9] associated with descendant Native Americans, the Overseas Chinese, or other potentially interested descendant group, an appropriate representative[10] of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archeological field investigations of the site and to consult with the ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the associated archeological site. A copy of the Final Archeological Resources Report shall be provided to the representative of the descendant group.

Archeological Testing Program

The archeological consultant shall prepare and submit to the ERO for review and approval an archeological testing plan (ATP). The archeological testing program shall be conducted in accordance with the approved ATP. The ATP shall identify the property types of the expected archeological resource(s) that potentially could be adversely affected by the Proposed Project, the testing method to be used, and the locations recommended for testing. The purpose of the archeological testing program will be to determine to the extent possible the presence or absence of archeological resources and to identify and to evaluate whether any archeological resource encountered on the site constitutes an historical resource under CEQA.

At the completion of the archeological testing program, the archeological consultant shall submit a written report of the findings to the ERO. If based on the archeological testing program the archeological consultant finds that significant archeological resources may be present, the ERO in consultation with the archeological consultant shall determine if additional measures are warranted. Additional measures that may be undertaken include additional archeological testing, archeological monitoring, and/or an archeological data recovery program. If the ERO determines that a significant archeological resource is present and that the resource could be adversely affected by the Proposed Project, at the discretion of the project sponsors either:

A) The Proposed Project shall be redesigned so as to avoid any adverse effect on the significant archeological resource; or

B) A data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

Archeological Monitoring Program

If the ERO in consultation with the archeological consultant determines that an archeological monitoring program (AMP) shall be implemented, the AMP would minimally include the following provisions:

[9] The term "archeological site" is intended here to minimally include any archeological deposit, feature, burial, or evidence of burial.

[10] An "appropriate representative" of the descendant group is here defined to mean, in the case of Native Americans, any individual listed in the current Native American Contact List for the City and County of San Francisco maintained by the California Native American Heritage Commission and in the case of the Overseas Chinese, the Chinese Historical Society of America.

- The archeological consultant, project sponsors, and ERO shall meet and consult on the scope of the AMP prior to any project-related soils disturbing activities commencing. The ERO in consultation with the archeological consultant shall determine what project activities shall be archeologically monitored. A single AMP or multiple AMPs may be produced to address project phasing. In most cases, any soils-disturbing activities, such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of piles (foundation, shoring, etc.), site remediation, etc., shall require archeological monitoring because of the risk these activities pose to potential archeological resources and to their depositional context. The archeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archeological resource;
- The archeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archeological consultant and the ERO until the ERO has, in consultation with project archeological consultant, determined that project construction activities could have no effects on significant archeological deposits;
- The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis;

If an intact archeological deposit is encountered, all soils-disturbing activities in the vicinity of the deposit shall cease. The archeological monitor shall be empowered to temporarily redirect demolition/excavation/pile driving/construction activities and equipment until the deposit is evaluated. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, pile driving activity that may affect the archeological resource shall be suspended until an appropriate evaluation of the resource has been made in consultation with the ERO. The archeological consultant shall immediately notify the ERO of the encountered archeological deposit. The archeological consultant shall make a reasonable effort to assess the identity, integrity, and significance of the encountered archeological deposit, and present the findings of this assessment to the ERO. If the ERO determines that a significant archeological resource is present and that the resource could be adversely affected by the Proposed Project, at the discretion of the project sponsors either:

A) The Proposed Project shall be redesigned so as to avoid any adverse effect on the significant archeological resource; or

B) A data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO.

Archeological Data Recovery Program

If the ERO, in consultation with the archeological consultant, determines that an archeological data recovery programs shall be implemented based on the presence of a significant resource, the archeological data recovery program shall be conducted in accord with an archeological data recovery plan (ADRP). No archeological data recovery shall be undertaken without the prior approval of the ERO or the Planning Department archeologist. The archeological consultant, project sponsors, and ERO shall meet and consult on the scope of the ADRP prior to preparation of a draft ADRP. The archeological consultant shall submit a draft ADRP to the ERO. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, shall be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- *Field Methods and Procedures.* Descriptions of proposed field strategies, procedures, and operations.
- *Cataloguing and Laboratory Analysis.* Description of selected cataloguing system and artifact analysis procedures.
- *Discard and Deaccession Policy.* Description of and rationale for field and post-field discard and deaccession policies.
- *Interpretive Program.* Consideration of an on-site/off-site public interpretive program during the course of the archeological data recovery program.
- *Security Measures.* Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities.
- *Final Report.* Description of proposed report format and distribution of results.
- *Curation.* Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains and Associated or Unassociated Funerary Objects

The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State and Federal laws. This shall include immediate notification of the coroner of the City and County of San Francisco and in the event of the coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The archeological consultant, project sponsors, ERO, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated

funerary objects (CEQA Guidelines. Sec. 15064.5(d)). The agreement shall take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects.

Final Archeological Resources Report

The archeological consultant shall submit a Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the final report. The FARR may be submitted at the conclusion of all construction activities associated with the Proposed Project or on a parcel-by-parcel basis.

Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archaeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound, one unbound and one unlocked, searchable PDF copy on CD of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest in or the high interpretive value of the resource, the ERO may require a different final report content, format, and distribution than that presented above.

Mitigation Measure M-CR-1b: Interpretation

Based on a reasonable presumption that archeological resources may be present within the project site, and to the extent that the potential significance of some such resources is premised on CRHR Criteria 1 (Events), 2 (Persons), and/or 3 (Design/Construction), the following measure shall be undertaken to avoid any potentially significant adverse effect from the Proposed Project on buried or submerged historical resources if significant archeological resources are discovered.

The project sponsors shall implement an approved program for interpretation of significant archeological resources. The interpretive program may be combined with the program required under Mitigation Measure M-CR-4b: Public Interpretation. The project sponsors shall retain the services of a qualified archeological consultant from the rotational Department Qualified Archeological Consultants List (QACL) maintained by the Planning Department archeologist having expertise in California urban historical and marine archeology. The archeological consultant shall develop a feasible, resource-specific program for post-recovery interpretation of resources. The particular program for interpretation of artifacts that are encountered within the project site will depend upon the results of the data recovery program and will be the subject of continued discussion between the ERO, consulting archeologist, and the project sponsors. Such a program may include, but is not limited to, any of the following (as outlined in the ARDTP): surface commemoration of the original location of resources; display of resources and associated artifacts (which may offer an underground view to the public); display of interpretive materials such as graphics, photographs, video, models, and public art; and

> academic and popular publication of the results of the data recovery. The interpretive program shall include an on-site component.
>
> The archeological consultant's work shall be conducted at the direction of the ERO, and in consultation with the project sponsors. All plans and recommendations for interpretation by the consultant shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO.

Implementation of the approved plan described in Mitigation Measure M-CR-1a would ensure that the significance of any CRHR-eligible archeological resource would be preserved and/or retained in place. If significant cultural resources are discovered, impacts would be mitigated through Mitigation Measure M-CR-1b.[11] With the implementation of Mitigation Measures M-CR-1a and M-CR-1b, the Proposed Project would not cause a substantial adverse change to the significance of an archeological resource, if present within the project site. Therefore, this impact would be less than significant with mitigation.

Impact CR-2: Construction activities for the Proposed Project would cause a substantial adverse change in the significance of human remains, if such resources are present within the project site. ***(Less than Significant with Mitigation)***

Because the project site has been substantially disturbed over the last two centuries, the possibility of discovering human remains is considered low. Although unlikely, it is possible human remains may be encountered during project implementation. Mitigation Measure M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting, presented on pp. 4.D.25-4.D.29, calls for compliance with applicable State and Federal laws regarding the treatment of human remains and of associated or unassociated funerary objects discovered during any soils-disturbing activity. This shall include immediate notification of the coroner of the City and County of San Francisco and the ERO and, in the event of the coroner's determination that the human remains are Native American remains, notification of the NAHC, who shall appoint an MLD (Public Resources Code Section 5097.98). The archeological consultant, project sponsors, ERO, and MLD shall make reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects.

With implementation of Mitigation Measure M-CR-1a, the Proposed Project would not cause a substantial adverse change to the scientific significance of an archeological resource resulting

[11] ESA, *Pier 70 Mixed-Use District Project, City and County of San Francisco, Archaeological Research Design and Treatment Plan,* June 2015, p. 111 and pp. 125-126.

from the disturbance of human remains. Therefore, this impact would be less than significant with mitigation.

Impact CR-3: Construction activities for the Proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code Section 21074, if such resources are present within the project site. ***(Less than Significant)***

As discussed above in "Native American Consultation" on p. 4.D.21, the NAHC was contacted by letter on March 19, 2015, to request information on known Native American sacred lands within the project site and to request a listing of individuals or groups with a cultural affiliation to the project area. A response was received from the NAHC on April 27, 2015, noting a records search indicated that no Native American cultural resources are known to be in the immediate vicinity of the project site. The letter also provided a list of Native American individuals who may have knowledge of cultural resources in the project site. On May 13, 2015, letters were sent to the nine individuals on the list, and to date no responses have been received.[12]

As discussed above in "Effects on Tribal Cultural Resources" on pp. 4.D.18-4.D.19, the particular noticing and tribal consultation requirements of AB 52 (codified in Public Resources Code Section 21080.3) do not apply to the Proposed Project for which a Notice of Preparation was filed with the State Clearinghouse on May 6, 2015, before enactment of AB 52.

A records search with the NAHC and outreach to individuals and groups with a cultural affiliation to the project site has yielded no evidence that any tribal cultural resources are present on the project site or that implementation of the Proposed Project would cause a substantial adverse change to the significance of any tribal cultural resources. For this reason, this impact would be considered less than significant.

Cumulative Impacts

Impact C-CR-1: Disturbance of archeological resources, if encountered during construction of the Proposed Project, in combination with other past, present, and future reasonably foreseeable projects, would make a cumulatively considerable contribution to a significant cumulative impact on archeological resources. ***(Less than Significant with Mitigation)***

Ground-disturbing activities of foreseeable projects, in particular (but not limited to) those along San Francisco's Central Waterfront, have the potential to disturb previously unidentified archeological resources that could yield information pertaining to common research themes identified for the Proposed Project in the ARDTP (consumer behavior, social status and identity,

[12] Matthew Russell, ESA, letter to Allison Vanderslice, San Francisco Planning Department, Re: Pier 70 Mixed-Use Project Native American Heritage Commission Contacts, November 5, 2015.

wharf and pier construction, land reclamation, and industrialization and technology). As such, the potential disturbance of archeological resources within the project site could make a cumulatively considerable contribution to a loss of significant historic and scientific information about California, Bay Area, and San Francisco history.[13]

As discussed above, implementation of the approved plans for testing, monitoring, and data recovery would preserve and realize the information potential of archeological resources. The recovery, documentation, and interpretation of information about archeological resources that may be encountered within the project site would enhance knowledge of prehistory and history. This information would be available to future archeological studies, contributing to the collective body of scientific and historic knowledge. With implementation of Mitigation Measure M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting, pp. 4.D.25-4.D.29, and Mitigation Measure M-CR-1b: Interpretation, pp. 4.D.29-4.D.30, the Proposed Project's contribution to cumulative impacts would not be cumulatively considerable.

As discussed under Impact CR-3, p. 4.D.31, there is no evidence that the Proposed Project would cause a substantial adverse change in the significance of a tribal cultural resource. For this reason, the Proposed Project in combination with past, present, and future reasonably foreseeable projects would not make a cumulatively considerable contribution to a significant cumulative impact on tribal cultural resources.

[13] As discussed above on p. 4.D.9, massive land transformation within the project site during the late nineteenth and early twentieth centuries is likely to have removed any traces of prehistoric surface deposits on the project site. Artificial fill overlaying Bay Mud and bedrock has a low potential to contain significant prehistoric archeological resources.

HISTORIC ARCHITECTURAL RESOURCES

The assessment of project impacts on "historical resources," as defined by CEQA Guidelines Section 15064.5, is a two-step analysis: first, the project site is analyzed to determine if it contains a "historical resource(s)" as defined under CEQA; second, if the site is found to contain historical resources, an analysis is carried out to determine whether the project could cause a substantial adverse change to the resource. A project that may cause a substantial adverse change in the significance of a historical resource is a project that may have significant effect on the environment (CEQA Section 21084.1).

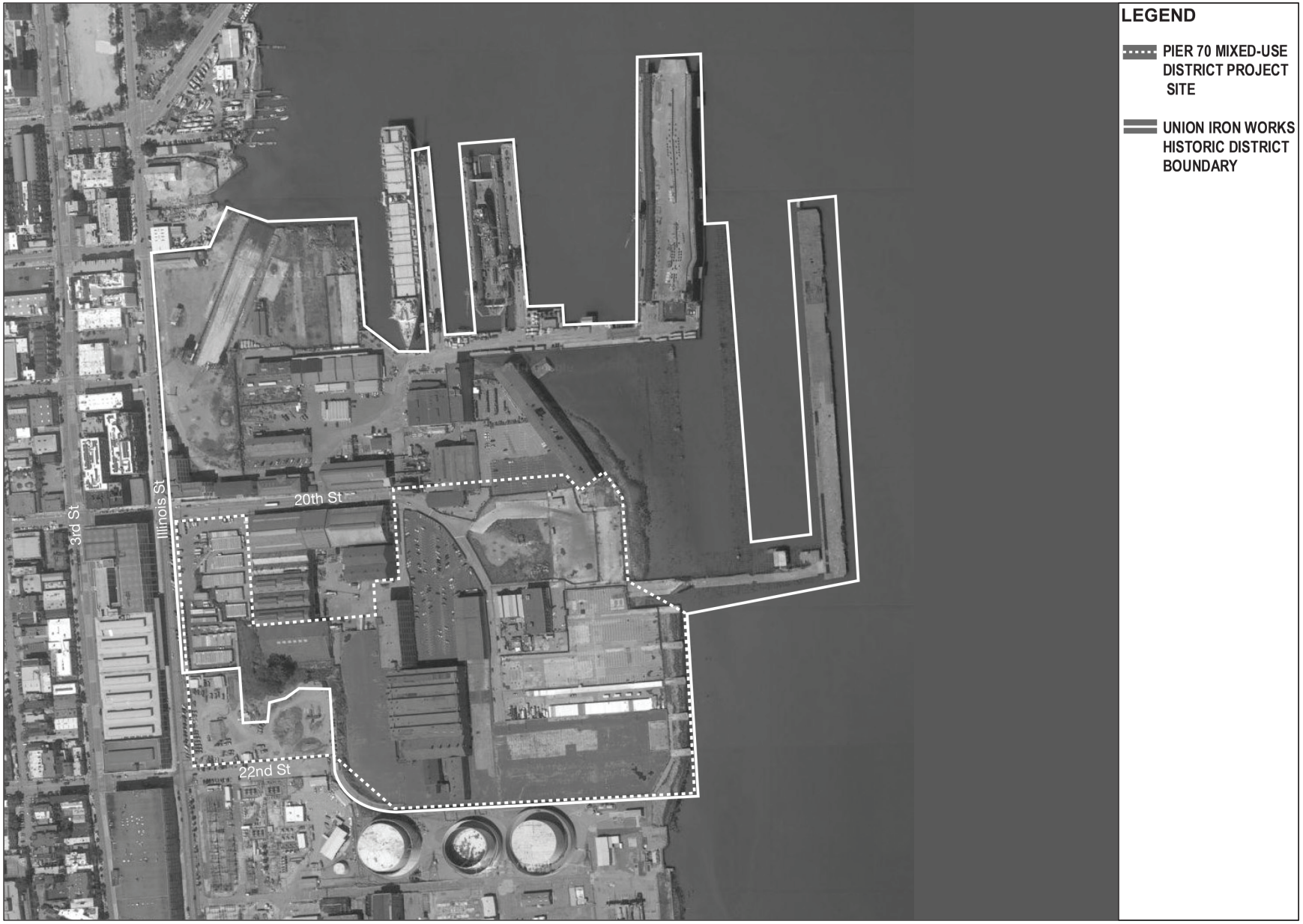
This section has two component subsections. The Environmental Setting discussion identifies the presence of historical resources in the project site. The Impacts and Mitigation Measures discussion evaluates the direct, indirect, and cumulative impacts of the Proposed Project on the historical resources identified in the Environmental Setting subsection.

ENVIRONMENTAL SETTING

The project site is located in a portion of the Pier 70 National Register Historic District, also known as the Union Iron Works (UIW) Historic District, which was listed in the National Register of Historic Places (NRHP or National Register) in 2014.[14] The UIW Historic District and project site boundaries are shown in Figure 4.D.1: Union Iron Works Historic District Boundary. The UIW Historic District is a maritime industrial district historically significant at the national level for its association with the development of steel shipbuilding in the United States, including its pioneering technological developments in shipbuilding, and the production of significant wartime vessels (NRHP Criterion A [association with important historical events]). The UIW Historic District is also significant at the local level because it is a physical record of the trends in industrial architecture from the late nineteenth century through World War II (NRHP Criterion C [architecture/design/construction]). The period of significance begins in 1884, with the construction of the shipyard, and ends in 1945 at the close of World War II.

The District contains 44 contributing buildings/structures/features that contribute to the significance of the District (collectively "contributing features") and 10 non-contributing features. Contributing features are those which were constructed during the period of significance, contribute to the historical significance of the UIW Historic District under NRHP Criteria A or C, and retain sufficient physical integrity to convey their significance. Non-contributing features of

[14] United States Department of the Interior, National Park Service, National Register of Historic Places Registration Form, *Union Iron Works Historic District*, April 17, 2014.



Source: Port of San Francisco; Google (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.1: UNION IRON WORKS HISTORIC DISTRICT BOUNDARY

the UIW Historic District are defined as those which have either lost integrity due to substantial alterations, or were constructed after the period of significance, or both. None of the contributing features of the UIW Historic District have been previously identified as eligible for listing in the NRHP based on individual significance in their own right, but they are collectively significant as contributing constituents of the UIW Historic District.[15]

Based upon an assessment of historic significance of each building and structure located in the project site and in the UIW Historic District that was undertaken as part of this review under CEQA, the Port of San Francisco, with Planning Department concurrence, determined that Building 21 is also individually eligible for listing in the California Register. This building is, therefore, considered to be a historical resource for the purposes of CEQA. None of the other features on the project site were determined to be individually eligible for listing in the California Register.

The project site encompasses approximately 32 acres[16] of the 66-acre District, and contains 12 contributing features within the District boundaries. Table 4.D.1: Contributing UIW Historic District Features on the Project Site, provides a list of the contributing features on the project site.

Table 4.D.1: Contributing UIW Historic District Features on the Project Site

Building Number (Name)	Date Constructed	Contributing	Individually Significant
Building 2 (Warehouse No. 2)	1941, 1944	Yes	No
Building 11 (Tool Room and Navy Office)	1941	Yes	No
Building 12 (Plate Shop No. 2)	1941	Yes	No
Building 15 (Layout Yard)	1941	Yes	No
Building 16 (Stress Relieving Building)	1941	Yes	No
Building 19 (Garage No. 1)	1941	Yes	No
Building 21 (Substation No. 5)	c. 1900	Yes	Yes
Building 25 (Washroom and Locker Room)	1941	Yes	No
Building 32 (Template Waterhouse)	1941	Yes	No
Building 66 (Welding Shed)	1945	Yes	No
Building 117 (Warehouse No. 9/Shipyard Training Center)[a]	1937-1941	Yes	No
Irish Hill (remnant) landscape feature	N/A	Yes	No

Note:

[a] Building 117 is within the project site but is part of the adjacent 20th Street Historic Core Building 40 and 117 project, as described on p. 4.A.14.

Source: United States Department of the Interior, National Park Service, NRHP Registration Form, *Union Iron Works Historic District*, April 17, 2014.

[15] Port of San Francisco, *Union Iron Works Historic District Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area, May 16, 2016*.

[16] Inclusive of the 3.4-acre 20th/Illinois Street parcel.

These contributing features are shown in Figure 4.D.2, Contributing and Non-Contributing Features on the Project Site, on p. 4.D.37.

There are 32 other contributing features within the UIW Historic District located immediately north and outside of the project site, primarily centered on 20th Street. Many of the buildings and structures in this area date from the District's earliest period of construction, and they are considered exceptionally rare examples of industrial Victorian-era architecture. See Table 4.D.2: Contributing UIW Historic District Features Outside of the Project Site.

As a property listed on the National Register, the UIW Historic District, including its contributing features, is automatically listed in the California Register of Historical Resources (CRHR). The Historic District is not listed in Article 10 or 11 of the San Francisco Planning Code as either individual landmarks or a local landmark site.

Under CEQA Guidelines Section 15064.5(a)(3), the UIW Historic District is defined as a "historical resource" because it is listed in the CRHR due to its listing in the NRHP.

Provided below is a historic context of the UIW Historic District, including descriptions of the contributing and non-contributing features within the project site. This historic context has been excerpted and summarized from the UIW Historic District National Register Nomination Form.[17]

HISTORIC CONTEXT

Nineteenth Century

The UIW Historic District can trace its origins to California's first iron works, opened by Peter and James Donahue at Jackson and Montgomery streets in San Francisco during the Gold Rush. In the early 1850s, the works moved to First and Mission streets, and in 1853 was renamed the UIW. The works constructed engines and boilers for iron ships, locomotive equipment for California's first trains, and most of the mining equipment used in the Comstock silver mines. Irving M. Scott managed the works starting in 1865, after Donahue retired, and was responsible for transforming it into one of the country's leading steel hull shipbuilding and repair companies.

By the early 1860s, the City's early wood shipbuilders abandoned the crowded shoreline along Steamboat Point in San Francisco's South of Market district for the deep waters and vacant lands around Potrero Point. John North was the first shipbuilder to relocate in 1862, followed by Henry Owens, William E. Colllye, and Patrick Tiernan. The 1867 completion of the Long Bridge from

[17] United States Department of the Interior, National Park Service, National Register of Historic Places Registration Form, *Union Iron Works Historic District*, April 17, 2014.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.2: CONTRIBUTING AND NON-CONTRIBUTING FEATURES ON THE PROJECT SITE

Table 4.D.2: Contributing UIW Historic District Features Outside of the Project Site

Building Number (Name)	Date Constructed
Building 6 (Light Warehouse No. 6)	1941
Building 14 (Heavy Warehouse)	1941
Building 30 (Template Warehouse)	1941
Building 36 (Welding Shop)	1941
Building 38 (Pipe and Electric Shop)	1915, 1941
Building 40 (Employment Office Annex)	1941
Building 49 (Galvanizing Warehouse)	1941
Building 50 (Pier 68 Substation No.2)	1941
Building 101 (Bethlehem Steel Administration Building)	1917
Building 102 (Powerhouse)	1912
Building 103 (Steam Powerhouse No. 2)	1937
Building 104 (UIW Office Building/Industrial Relations Building)	1896, 1941
Building 105 (Forge Shop)	1896, 1937
Building 107 (Lumber Storage)	1937
Building 108 (Planning Mill and Joinery Shop)	1911, 1913
Building 109 (Plate Shop No. 1)	1912, 1936
Building 110 (Yard Washroom and Locker Room)	1936
Building 111 (Main Office and Substation No. 3)	1917
Building 113 (UIW Machine Shop)	1885
Building 114 (Blacksmith Shop)	1886
Building 115 (Concrete Warehouse)	1916-1917
Building 116 (Concrete Warehouse)	1916-1917
Building 119 (Yard Washroom)	1936
Building 120 (Pipe Rack/Women ‘s Washroom and Locker Room)	1936, 1942
Building 121 (Drydock Office)	1941
Building 122 (Check House No. 1)	1937
Building 123 (Check House No. 2)	1914. 1941
Slipways 1-3 (site of Slipways 1, 2, and 3)	ca. 1890, 1915, 1959-1964
Slip 4, and Cranes 14 and 30	1941, 1943
Whirley Crane 27	1942
Pier 68 (Highwater Platform)	ca. 1920, 1941, 1944
Iron Fence (at 20th and Illinois streets)	1941, 1943

Source: United States Department of the Interior, National Park Service, NRHP Registration Form, *Union Iron Works Historic District,* April 17, 2014.

South of Market over the waters of Mission Bay, and the extension of Third Street, improved access and eased transportation to this developing manufacturing center in the Potrero district. The Irish Hill and Dogpatch neighborhoods emerged as workers moved to the area. The Irish Hill neighborhood consisted of two settlements of cottages, lodging houses, and saloons clinging to the hillside north of the Pacific Rolling Mills and around the intersection of 20th and Illinois streets.

The deep waters around Potrero Point facilitated easy loading and unloading of cargo, making it an excellent location for the new UIW shipyard. Located in the outskirts of the City, Potrero Point also made an ideal manufacturing area for hazardous materials. The E. I. du Pont de Nemours Company was one of the first manufacturers to exploit this region in 1854 to manufacture black powder. Over the following decades, the Tubbs Cordage Company/San Francisco Cordage Manufactory, Pacific Rolling Mills, and City Gas Company Works moved to the area. Pacific Rolling Mills, whose property would eventually be managed by UIW under Bethlehem Steel ownership, was the first manufacturer of steel on the West Coast, starting in the 1860s.

The UIW shipyard opened at Potrero Point in 1884 with a machine shop (Building 113), plate shop, pattern shop, foundry, smith shops, and slipways. The next year the yard launched the *Arago*, the first steel hull ship produced by UIW and launched on the West Coast, and one of the first steel hull ships completed in the country. In 1885, after the yard's success with the *Arago*, Scott and UIW secured naval contracts, initiating a relationship between the U.S. Navy and the yard that lasted through World War II. During the late nineteenth century, the shipyard completed some of the most famous warships of the Spanish-American War, including the *USS Oregon* and the *USS Olympia*.

Early Twentieth Century

In 1902, the United States Shipbuilding Company (USSC) acquired UIW along with other yards and steel mills across the country. Two years later, the USSC collapsed, allowing Charles Schwab to purchase the shipyard in 1905 on behalf of the Bethlehem Steel Company, the second largest steel manufacturer in the country. In the spring of 1908, Schwab personally oversaw upgrades to the yard's repair facilities, which allowed the yard to repair the Great White Fleet, the naval fleet that President Theodore Roosevelt ordered to sail around the world from 1907 to 1909 as a display of the country's growing military power.

By World War I, the shipyard served as the headquarters of a West Coast shipbuilding complex, which included the Hunters Point Drydock, the Alameda Yard, and the U.S. Navy Destroyer Plant. Renowned San Francisco architects such as George Percy and Frederick Hamilton designed the UIW office building (Building 104) at the corner of 20th and Illinois streets, creating a grand entrance to the yard. The shipyard was expanded and modernized in the 1910s to include

infrastructure expansion, a new plate shop (Building 109), and new foundries (Building 115/116). The destroyer plant run by UIW used some of the new prefabrication methods of the period to produce three destroyers per month. The Navy prioritized submarine destroyers as the primary fleet defense against torpedo attacks from submarines, and the 66 destroyers produced by the yard made a substantial contribution to the World War I naval effort.

The yard survived the lean years after World War I on commercial ship construction and ship repair contracts. United States Maritime Commission contracts, starting in 1936, resulted in a new wave of modernization at the yard. Upgrades included a new boiler house (Building 103), a new steel warehouse (Building 117), and a yardwide transformation from riveting to welding, which helped the yard adapt to standardized mass production that typified World War II ship production. During the war, the yard was primarily under naval management. The New Yard shipbuilding facility (Building 12 complex) built by the Navy stands on the former destroyer plant. The yard also significantly contributed to World War II in the repair of 2,500 ships.

After World War II, the yard continued to build government and commercial ships into the 1970s. In the early 1980s, the Bethlehem Steel Company went bankrupt and sold the shipyard for one dollar to the Port of San Francisco. Todd Shipyards purchased much of the machinery and leased portions of the yard for ship repair. BAE Systems Ship Repair leases portions of the yard from the Port of San Francisco and continues to operate a repair facility on-site, making the yard the longest operating steel hull ship repair yard in the country.

World War II

General expansion of the shipyard occurred during the start of World War II, including new buildings and further construction and expansion of slipways and wet basins along the waterfront. Much of this work was designed, owned, and paid for by the U.S. Navy. The most substantial development was the expansion of the southeastern slipways and construction of the New Yard, also known as the Building 12 complex, comprising Buildings 12, 15, 16, 25, 32, and 66 (see discussion below). UIW also saw increased specialization of buildings during this period, specifically buildings for outfitting and ship repair.

The New Yard/Building 12 Complex

The New Yard consisted of four slipways, a plate shop, a machine shop, a warehouse, a layout yard, welding platforms, and additional smaller support buildings. The shift toward welding required welding platforms and layout areas around the slipways. The slipways for the New Yard were completed in 1941, replacing the World War I–era destroyer yard slipways and associated plate shop. Building 2 replaced a warehouse dating to the Risdon period. This portion of UIW was developed with buildings and structures ranging from 80 feet (Building 2) to 120 feet high (scaffolding for Slipways 5, 6, 7 and 8).

The New Yard optimized its layout for pre-assembly and welding following the turning flow design. Since the beginning of steel shipbuilding, the goal of shipyards was to keep parts moving forward, from the arrival of raw materials through the final assembly of vessels. By World War II, the use of a linear or straight flow of materials was considered optimal, and a straight line flow was a noted accomplishment of the new World War II yards. However, shipyards with limited space often implemented the turning flow design. Instead of the optimal strictly linear movement from the storage areas to the slipways, the turning flow design allowed for materials to enter the yard parallel to the shoreline, move through the shops in a straight line, and then turn to be assembled on the shipways.

At the New Yard, the working plans for a ship were drafted in the administration office (Building 101) or the naval office (Building 104). Plans were laid down in the mold loft, and templates were made and moved downstairs to the plate shop. Following the turning flow process, raw steel entered by rail at the top end of the yard and was held in storage yards to the west of the plate shop (Building 12) until needed. The steel was then formed in the plate shop and, as required, joined into sub-assemblies. Cranes carried the sub-assemblies to the welding platforms where the parts were joined into even larger sections, such as deck houses and bow and stern assemblies. Completed sub-assemblies were then moved by cranes to the slipways. At the New Yard, pre-assembly was also completed on welding platforms adjacent to the slipways. When the hull was completed, it was launched and moved to outfitting piers.

During World War II, specialized engineering and outfitting buildings were constructed or repurposed between the New Yard and the outfitting wharves. These buildings corresponded with specific outfitting and engineering divisions, including pipe, rigging, electrical, carpentry and joinery, sheet metal, and paint shops. Most of the engine and boiler work remained at Building 105 and Buildings 113/114. Material was moved by rail and cranes from these buildings to the outfitting wharves and installed in the hulls.

Ship repair was the main contribution of UIW to the World War II effort. During this period, the yard built over 70 ships and repaired 2,500 ships. The repair yard, which contained structures and even equipment that dated back to the origins of steel shipbuilding in this country, was one of the best and the largest commercial repair yards in the country. Provided below is a summary of the historical significance of the UIW Historic District under NRHP Criteria A and C.

NATIONAL REGISTER OF HISTORIC PLACES SIGNIFICANCE SUMMARY

The following is a summary of the historical significance of the UIW Historic District, excerpted from the National Register Nomination Form[18], with a focus on the District's historic and architectural significance associated with World War II.

Criterion A (Events)

UIW Historic District is significant under Criterion A. The District was one of the first steel hull shipyards in the country, and the first on the West Coast. It actively participated in every trend in steel shipbuilding, and the yard embodies each of those trends. UIW was an industry leader and technological pioneer during the late nineteenth century through the turn of the twentieth century, influencing shipyards in other parts of the country. It continued successfully to adopt emerging practices in prefabrication and design standardization, while retaining its original capacity to fabricate all ship components on site. The yard made significant contributions to every war effort from the Spanish-American War through World War II. It produced hundreds of ships and repaired thousands, including each of the most influential types of vessels in each war. UIW furthermore originated steel shipbuilding on the West Coast, and for most of its history, it served as the headquarters of domestic shipbuilding and ship repair for the Pacific. The yard was able to balance emerging technology with older shipbuilding and repair practices, enabling it to convey its national level of significance over each phase of development, rather than just one single period.

Criterion C (Architecture)

UIW Historic District is also historically significant under Criterion C at the local level as a District that represents a distinctive and exceptional entity. It illustrates national trends in industrial, and especially shipyard, architecture, from 1884 to 1945. Functional and aesthetic forces determined the appearance of the buildings and the layout of the yard, forces that relate to the larger national context of factory design from the early 1880s to 1945. The UIW Historic District's built environment is subdivided into four periods, each corresponding to larger national trends in industrial architecture. The World War II period is described below because it is within this context that most of the buildings on the project site were constructed.

World War II created an emergency situation requiring the construction of new ships, and, therefore, new shipbuilding facilities, as quickly as possible. Most new buildings from this period, similar to other World War II shipyards, were steel frame construction with corrugated metal cladding, relatively quick to erect. Buildings constructed in the 1930s have a brick base;

[18] United States Department of the Interior, National Park Service, National Register of Historic Places Registration Form, *Union Iron Works Historic District*, April 17, 2014.

those constructed after 1940 do not. Steel frame buildings, including pre-fabricated buildings, became especially popular during World War II for both military and civilian industrial uses because of their relative ease and speed of construction.

In 1940, UIW was contracted, along with only five other private shipyards nationwide, to perform Navy work exclusively. To promote this contractual arrangement, the Federal government made further investments in UIW. Most notable was the New Yard, now known as the Building 12 complex, located at the District's southeast quadrant where Risdon Iron Works once stood. A major upgrade to the rail system united the new facility with the rest of the shipyard.

The Building 12 complex, comprising Buildings 12, 15, 16, 25, 32, and 66, was largely built in 1941 to construct anti-aircraft cruisers. Building 12, which housed the plate shop and mold loft, comprised steel frame construction with corrugated steel cladding, which was typical of this period. The complex lacks a stylistic veneer, but displays a visual power derived from its massing and the rhythm of its openings and roof monitors.

The Building 12 complex and other developments at UIW from this period reflect the concept of functional specificity in several ways. Most important was the rationalization of the workflow process by establishing a straight or turning flow pattern. The desire for efficient work flow affected building placement and adjacencies, as well as the material handling system connecting the buildings. Other examples of functional specificity include the establishment and strategic placement of welding platforms and assembly layout areas, and proximity to slipways, where final assembly and fitting out occurred.

Buildings 12, 15, 32, and 16 connect on at least one elevation. Within, they form a single interior space. Although the compact Building 12 complex approaches the industrial ideal of containing an entire production process within one space, much of the assembly took place on open platforms or in adjacent slipways. Spatial constraints most likely dictated the compact form, as well as the turning, rather than the straight flow process.

Concrete buildings, such as Warehouse 2 (1941), continued to be built during World War II, as did many smaller wood frame buildings, most providing worker amenities. Although the buildings from this period were similar in size, design, and layout to those at other shipyards, they were not necessarily typical of other industrial buildings during this period. This is because building design was centered on the functionality of the building and not a particular aesthetic or style.

CHARACTER-DEFINING FEATURES OF UIW HISTORIC DISTRICT

Character-defining features of the UIW Historic District include those buildings, structures, and landscapes which contribute to the significance of the District and convey its importance under

NRHP Criteria A and C. For example, the buildings located along 20th Street – Buildings 113, 101, 102, 103, and 104 – and the south wall of Building 105, function to create an architectural promenade and entrance to the yard and, as a group, define the strong architectural and industrial character of this portion of the District. The fencing installed during World War I along Illinois and 20th streets is largely intact, and the entrance to the shipyard has remained at the same location since the 1890s.

The density of this urban industrial center and the variation in materials, styles, rooflines, cranes, chimneys, and waterfront features convey its historic evolution and distinguish it from other shipyard and industrial sites built or heavily remodeled during a single period. The materials used within the District are a physical record of the evolution of UIW Historic District and include unreinforced masonry, wood, concrete, and sheet metal construction. All of these features and materials are considered character-defining features of the District.

Buildings that create visual landmarks by their prominence, location, and size can be considered character-defining features of the District, as well as other contributing features. Since the 1930s, Building 103 and its large smokestack have dominated the view of the UIW Historic District from its entrance and have defined the end of 20th Street.

In addition to the 44 contributing features that comprise the UIW Historic District, the District also possesses the following character-defining features:

- Waterfront location/shoreline;
- Minimal planted vegetation;
- Open areas that are either paved with asphalt or covered with gravel;
- Streets that are improved without curbs and gutters, except for 20th Street, which has granite curbs;
- Dense urban-industrial character;
- Variation in materials, styles, rooflines, and window types;
- Variation in height and scale, with resources that range from one to six stories (80 feet) in height, some with large footprints of 60,000-100,000 square feet;
- Certain groupings of buildings, such as the entry promenade along 20th Street and the Building 12 complex;
- Features such as cranes;
- Ship repair activities; and
- Yard layout and plan.[19]

[19] United States Department of the Interior, National Park Service, National Register of Historic Places Registration Form, *Union Iron Works Historic District*, April 17, 2014.

District Integrity

The end of World War II represented the maximum build-out of the District. Since 1945, few new buildings have been added, and buildings of primary importance from all periods of growth and modernization remain. The most notable modifications to the Historic District since World War II include the following:

- Removal of above-grade features of Slipways 1 through 3 and 5 through 8;
- Removal or rebuilding of wharves and piers including Wharves 1, 3, 4, and 5 at Pier 68 and Wharf 8 at Pier 70 (includes Building 64). Wharf 8 was altered in 1941, 1942, and 1944, and completely rebuilt after 1980;
- The loss of support buildings on deteriorating wharves;
- Removal or paving over of paving stones and rail lines;
- Removal of the large gantry cranes associated with Buildings 12 and 109;
- The installation of modular buildings and construction of new buildings including the BAE Systems office and a Butler Building (Building 251) to accommodate sandblasting functions north of Building 105;
- Removal of a row of buildings between Building 6 and the New Yard. The following buildings were removed from this area after the period of significance and all but the first two date from the World War II expansion:
    - Building 4 - Sheet Metal Shop (built in 1900 with World War I and World War II additions);
    - Building 5 - Copper Shop (built in 1900 with World War I and World War II additions);
    - Building 7 - Light Warehouse;
    - Building 8 - Riggers, Carpenters, and Painters Shop;
    - Building 9 - Pipe Shop No. 2;
    - Building 10 - Pipe Rack and Locker Room;
    - Building 22 - Washroom;
    - Building 56 - Sheet Metal Shop;
    - Building 57 - Central Kitchen;
    - Building 61 - Scale House.

Despite the loss of some contributing features, the UIW Historic District forms a contiguous district with a variety of conditions. The Historic District includes examples from all periods of construction and expansion, from the opening of the yard in the early 1880s to the end of World War II. It retains sufficient historic integrity to convey its role in the birth and expansion of the U.S. steel hull shipbuilding industry and reflects the development of industrial architecture from the 1880s to 1945.

DESCRIPTION OF CONTRIBUTING AND NON-CONTRIBUTING FEATURES ON THE PROJECT SITE

Provided below are detailed descriptions of all 12 contributing features on the project site, comprising the 11 contributing buildings and 1 contributing landscape feature. Also included below are descriptions of non-contributing features within the District. These descriptions have been excerpted and summarized from the National Register Nomination Form.[20] Table 4.D.1, p. 4.D.35, identifies all of these by building number, name, and date constructed (where applicable).

Contributing Features

Building 2 (Warehouse No. 2)

Building 2 stands east of the complex formed by Buildings 113/114, 115/116, and 117. The land was formerly occupied by a portion of Irish Hill. The architect and builder of this industrial-vernacular building are unknown. It was likely designed and built by government personnel as part of the joint public-private World War II shipbuilding effort.

DESCRIPTION

Building 2 is a six-story, board-formed, concrete warehouse, rectangular in plan with a flat roof. Constructed in 1941 and 1944, it measures 256 feet long, 76 feet 9 inches wide, and 79 feet 6 inches high. Containing a total of 98,804 square feet, it is one of the tallest extant buildings in the UIW Historic District. It runs north to south, with one loading door at the north façade and three at the north end of the west façade. Also on the north façade is a personnel entrance protected by a flat awning and accessed by three stairs. The windows are steel, multi-pane, and fixed sash, and most contain operable, four-lite, central vent sashes.

The top floor, dating to 1944, has wood sash windows, which match the style of the steel sash on the lower floors. An elevator and stair tower project slightly from the west façade. Painted signage on the north end designates the building as "Warehouse 2." As on the exterior, concrete is the primary interior building material. The walls and ceiling of each floor are of board-formed concrete, and the floor is exposed concrete slab, except at the sixth floor, which has wood boards over the original concrete roof slab. Columns on a 20-foot grid divide the interior into bays; columns located on floors one through four are round with flared capitals, and those on floors five and six are square. Except for the columns, each level consists primarily of open space used for storage. The large freight elevator and stairwell stand along the west wall near the north end of the building.

[20] Ibid.

HISTORIC/CURRENT USE

Building 2, constructed during World War II, originally functioned as a warehouse to support hull construction at the Building 12 complex and outfitting. The sixth floor of the building contained a drafting room, and offices were located on the first and second floors. A bridge connects the fourth floor to the mold loft in Building 12, located south of Building 2. This building is currently used for commercial storage. Along with Building 111, Building 2 is one of two multi-story warehouses extant in the District.

INTEGRITY

Building 2 has undergone few alterations since its construction, with the exception of the sixth floor addition in 1944 that falls within the period of significance for the District. Therefore, the building retains a high degree of integrity and is a contributor to the UIW Historic District for its associations with World War II shipbuilding. It is one of the few concrete buildings from the World War II period and adds to the diversity of materials used within the District.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Because Building 2 is one of several warehouse buildings within the district that collectively played a support role in the ship building process, it is not considered to possess individual significance or to be individually eligible for listing in the California or National Registers.[21]

Building 11 (Tool Room and Navy Office/Noonan Building)

Building 11 stands just east of Building 21 and west of a paved parking lot, accessed by a road to the north. The infilled Slipways 5 through 8 are to the southeast, and the Building 12 complex (see discussion below) is to the southwest. Located on the site of the Pacific Rolling Mills former sheet and tin plate warehouse, Building 11 was built in 1941 by the Navy as part of the New Yard to aid in production related to World War II.

DESCRIPTION

This three-story, rectangular wood frame building is 156 feet long by 72 feet wide by 38 feet high and contains 32,664 square feet. It has a flat tar and gravel roof and is clad with horizontal wood siding. Two stair towers project one story above the roof. Windows are wood double-hung with simple wood surrounds, often paired. Exterior open staircases at the west and north elevations

[21] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

lead to small landings and doors at the second story. Doors include single metal units at each elevation, a wood freight door centered in the east elevation, and a sliding metal door at the north.

The interior currently includes artist studios and office space. First floor spaces open directly to the exterior, without internal circulation. Exterior stairs access the second floor double-loaded corridor, whereas interior winding stairs connect the second and third floors.

HISTORIC/CURRENT USE

Building 11 provided support for hull construction at the Building 12 complex. The first floor originally contained a tool room, temporary lights department, and burner department, as well as three small offices. The two upper floors were devoted to office space. Interior signage indicates that the offices were used by the U.S. Navy. The building contained a cafeteria as well. Currently, artist studios and offices occupy the building.

INTEGRITY

Although the building has sustained minor alterations, mostly on the interior related to change of use, it maintains a high degree of integrity of location, setting, feeling, and association; and a moderate degree of integrity of design, materials, and workmanship. Therefore, it is a contributor to the UIW Historic District for its association with World War II.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Building 11 does not possess individual significance because it was a support office to the "New Yard," and the loss of the above-ground portions of related Slipways 5, 6, 7, and 8 has compromised this building's ability to convey its role in the larger ship-building process. Therefore Building 11 does not qualify for listing under the National or California Registers as an individual historical resource.[22]

Building 12 (Plate Shop No.2)

Building 12 was constructed in 1941 as the central building of the New Yard. The building was designed and built by government (Navy) personnel as part of the joint public-private World War II shipbuilding effort.

[22] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)"; December 6, 2016.

DESCRIPTION

Building 12 measures 248 feet 2 inches by 242 feet two inches in plan by 59 feet 6 inches tall, and contains 118,890 square feet spread across two floors. Construction is steel and wood with corrugated steel cladding. The roofline is an Aiken configuration, with five raised, glazed monitors running east to west for the width of the building. Clerestory multi-lite steel sash awning windows extend the length of the monitors on the north and south sides. The central monitor measures twice the width of the others. Twelve vertical bays divide the east and west elevations into 24-foot sections. Three bands of multi-lite steel sash awning windows, with a double-height bottom band, line the north and east elevations. Below the topmost band of windows, the south elevation directly connects to Building 15. Four bands of multi-lite steel sash awning windows run the length of the east elevation, and the top band on all four sides provides light into the mold loft. A shallow ridge runs north to south along the center of the building, over the monitors, and the roof gently slopes at 4 inches per 1 foot to the east and west. The west elevation has three vehicle roll-up doors, whereas the north has two.

On the ground floor, two rows of columns running north to south divide the interior into three bays. Exposed square Howe trusses support the second floor 38 feet 4 inches above the ground. Lighting consists of standard factory lights with glass reflectors. On the north end of the building, two steel staircases with concrete treads provide access to the upper level. Asphalt paves the ground floor.

The 360 degree band of windows and the clerestory monitor windows give the second story mold loft superlative light qualities. The mold loft has a wood plank floor, and wood cladding lines the walls up to window height. The ground-floor columns penetrate through the mold loft floor to divide the space into three separate bays, with 9-foot 7-inch ceilings that rise to 17 feet 4 inches in the monitors. The mold loft has industrial light fixtures similar to those on the first floor. Two personnel doors open onto the roof of Building 15 on the south elevation, and on the north elevation, an enclosed walkway connects to Building 2. A dumbwaiter shaft opens near the walkway. In the northeast corner, partitions enclose an office, game room, and bathroom.

HISTORIC/CURRENT USE

Building 12 housed the plate shop and mold loft for the Building 12 complex and was central to hull construction at Slipways 5 through 8 to the east. The building was constructed on newly leveled ground where most of Irish Hill once stood. It was one of a number of buildings constructed for the large enterprise of shipbuilding specifically for World War II. In the process of producing a ship from blueprint to hull, the construction plans were first transferred to a life-size model in the mold loft. This pattern was then taken to the mold makers who made a template out of wood, used for the guidance of marking the steel plates. Steel plates were stored in the

adjacent yard to the west. The marked plates were then cut and shaped into the desired hull shapes. The finished plates were then transferred to the adjacent layout yard (Building 15) where the plates were checked against the molds and plans before welding. The plates were moved from the yard to Building 12 and from Building 15 to the welding platforms and slipways via U.S. Navy–owned rail lines. A rail line connecting Building 12 to the rest of the shipyard also ran next to the east elevation of Building 2. Building 12 stood adjacent to Machine Shop 2 (now demolished) and the layout yard (Building 15) as the center of this World War II–era complex. Welding platforms adjoined these buildings to the south, linking the complex with Slipways 5 through 8. The building is currently vacant and is periodically used for temporary events.

INTEGRITY

Building 12 has experienced few alterations and retains integrity of location, design, setting, materials, workmanship, feeling, and association. The main alteration to the building is the removal of machinery and equipment, including cranes, from the first floor. Building 12 contributes to the UIW Historic District because of its association with the World War II shipbuilding historic context. It is also a representative example of industrial architecture from World War II. It forms the core of the Building 12 complex, which also includes Buildings 15, 16, 25, 32, and 66 (see description of each, below).

EVALUATION OF INDIVIDUAL SIGNIFICANCE

While Building 12 is historically important as the central feature of the Building 12 complex that provides continuity with the World War II-era last phase of shipyard development known as the "New Yard" and helps convey the significance of the UIW Historic District, the building does not possess sufficient significance to qualify individually for listing in the California or National Registers.[23]

Building 15 (Layout Yard)

Building 15 stands at the south end of the District and is part of the Building 12 complex. The group, including Buildings 12, 15, 16, 25, 32, and 66, was constructed in 1941-1944 specifically for World War II. The architect/engineer and builder are unknown. The building was likely designed and built by government personnel as part of the joint World War II effort.

[23] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

DESCRIPTION

This east-west oriented warehouse is immediately adjacent to Building 12 and measures approximately 242 feet 8 inches by 71 feet 7 inches, with an interior area of 17,134 square feet. A Fink truss with a king post supports the gabled roof, with the peak approximately 53 feet off the ground. Nine columns along the interior walls subdivide the space into eight distinct bays. The gabled roof covers the seven eastern bays; a flat roof of wood joists and decking covers the eighth, westernmost bay. A steel staircase on the south exterior wall leads to the flat roof, and a personnel platform on the roof rises slightly above the steel parapet.

Building 15 attaches to four other buildings, three to the south (Buildings 32, 25, and 16) and one to the north (Building 12), leaving only the eastern and western ends exposed. On the interior, no significant walls or partitions separate Building 15 from Buildings 12 or 32, creating a unified interior space between the three buildings, although at the northeast corner of Building 15, a corrugated steel wall with multi-lite steel sash windows partially divides the easternmost bay from Building 12. The southern interior wall features a cut-out through the corrugated steel that reveals the exterior north elevation of Building 25. Short wood planking serves as a roof over the approximately 1-foot gap between the two buildings. Two wood personnel doors on either side of the Building 25 cut-out provided access between the two buildings. Where Building 16 and Building 15 meet, newer corrugated steel covers the wall, and non-corrugated steel panels cover the wall at ground level. Standard industrial light fixtures, apparently original, remain.

On the exterior, the upper portion of the western façade features a corrugated steel parapet above a continuous band of multi-lite, steel sash pivot windows spanning the entire façade width. A similar band of windows glazes the ground level, interrupted by a large vehicle door in the central bay. Most of the southern elevation attaches to smaller buildings, but the western end of this elevation features a band of multi-lite windows above a vehicle door large enough for rail cars. The eastern elevation includes a band of multi-lite steel sash pivot windows at the upper level, and a roll-up steel door at the ground level. The northern façade of Building 15 attaches to Building 12.

HISTORIC/CURRENT USE

The layout yard served as an intermediate staging area for the steel plates of a vessel's hull used for hull construction in Slipways 5 through 8. As the plates left the plate shop (Building 12) adjacent and to the north, they were arranged, numbered, and checked against the molds and plans. This process assured that the welders had the correct panels lined up for welding. This occurred on either one of the welding platforms, if pre-assembled, or directly on the hull of the ship in one of the slipways to the east. U.S. Navy–owned rail lines transported the steel plates to the welding platforms and slipways of the New Yard. The personnel platform and stairs leading

up to the flat roof on the western edge of the building indicate a potential use as a viewing platform to oversee activities in the plate storage yard to the west. These former staging areas remain between Building 12 and the remnant of Irish Hill to the west. The building is currently vacant and is periodically used for temporary events.

INTEGRITY

Building 15 contributes to the UIW Historic District because of its association with the World War II steel shipbuilding effort undertaken at the New Yard. Building 15, the layout yard, has experienced few alterations and retains integrity of location, design, setting, materials, workmanship, feeling, and association.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Building 15 is a contributor to the UIW Historic District, but does not possess individual significance. Together with Buildings 16, 25, and 32, Building 15 functioned as a support building to Building 12: these other buildings are experienced as smaller additions rather than as separate resources. For these reasons, and because it lacks individual distinction, Building 15 does not qualify for listing under the National or California Registers as an individual historical resource.[24]

Building 16 (Stress Relieving Building)

Building 16, at the south end of the District, is part of the Building 12 complex, comprising Buildings 12, 15, 16, 25, 32, and 66. The actual architect and builder are unknown, but it was designed and built by government personnel in 1941 as part of the joint World War II effort.

DESCRIPTION

This two-story gabled warehouse measures 50 feet 10 inches by 152 feet 2 inches in plan and 45 feet 7 inches in height. It contains a total of 7,588 square feet, and corrugated steel panels cover the steel frame. Five prominent vents run along the gable ridge. The upper portion of all exposed façades features a band of multi-lite, steel sash awning windows with operable vents near the top of the building.

The eastern façade has five bays and two roll-up steel doors that interrupt a lower band of windows. The southern façade, divided into three bays, is almost entirely covered with steel sash windows, and has a single steel personnel door. The western façade, visible from a courtyard

[24] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

formed by neighboring Buildings 15 and 32, reveals more multi-lite, steel sash windows and two metal personnel doors with windows.

The interior consists of one open bay, with a concrete foundation and a double-height ceiling approximately 33 feet 7 inches from the ground. An exposed steel compound Fink truss with a king post top forms the gable, rising an additional 12 feet. The former entrance from Building 16 into Building 15 now appears covered with metal panels. Some standard factory light fixtures remain.

Along the western façade, a large industrial furnace with a gable roof approximately 20 feet tall attaches to Building 16. The furnace features steel framed doors at the east and west elevations, with the eastern door opening directly into Building 16. The doors slide vertically into a protected compartment, and fire brick appears through holes in the doors. Four hydraulic actuators tightly seal the furnace wrap around the door's perimeter. A chimney stands along the southern side, and numerous exposed mechanical components envelop the north and south elevations of the furnace.

HISTORIC/CURRENT USE

The Stress Relieving Building was used for hull construction at the Building 12 complex. Related to quality control, pre-assembled welded components for ship hulls in Slipways 5, 6, 7, or 8 would have joints relieved of the stress inherent in the bond from imperfect welds. Stress relieving involved re-heating the bond juncture, burning the ridge and inserting a splint or "strong back" mechanically, and re-welding the joint in a controlled environment. The building is currently vacant and is periodically used for temporary events.

INTEGRITY

Building 16, the Stress Relieving Building, has experienced few alterations and retains integrity of location, design, setting, materials, workmanship, feeling, and association. Building 16 contributes to the UIW Historic District for its association to the World War II steel shipbuilding effort at the New Yard. The industrial furnace connected to this building is also a character-defining feature and is the only example of this type of furnace in the District.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Building 16 is a contributor to the UIW Historic District, but does not possess individual significance. Together with Buildings 15, 25, and 32, Building 16 functioned as a support building to Building 12 and, as in the case of Building 15, these other buildings are experienced as smaller additions rather than as separate resources. Additionally, like Building 15, Building 16

lacks individual distinction. For these reasons, Building 16 does not qualify for listing under the National or California Registers as an individual historical resource.[25]

Building 19 (Garage No. 1)

Building 19, just south of Building 108, is surrounded by open space on the east, west, and south elevations. This building stands at the end of 21st Street, which was closed during World War II. The architect and builder of this simple, industrial building, built in 1941, are unknown.

DESCRIPTION

This is a one-story, rectangular-plan gable-roofed warehouse with corrugated, galvanized steel roofing and cladding. It measures 50 feet 8 inches by 24 feet 6 inches in plan and 31 feet 6 inches tall, and contains a total of 6,152 square feet. Windows are fixed, multi-lite steel sash with central ventilators; many lites[26] are boarded or painted over. Rolling metal doors appear on the west, east, and south elevations.

The north elevation is board-formed concrete and stands higher than the adjacent east and west elevations. A small metal shed attaches to the west elevation. The interior is a single open space. Walls are corrugated metal, except for the concrete north wall. Modified Howe trusses form the roof structure and the floor is concrete slab. Freestanding machinery includes a sifter/conveyor, and the building stores sandblast grit, used to sandblast ships prior to painting.

HISTORIC/CURRENT USE

Listed as Garage No. 1 and owned by the government on the Bethlehem 1945 plan, this building was used as a garage and housed a small office during World War II. It adjoins Building 108, a planing mill and joiner shop. Building 19 is currently used by BAE Systems for storage of sandblasting grit.

INTEGRITY

Despite minor alterations, such as the attached metal shed at the west elevation, the building retains a high degree of integrity and therefore is a contributing resource. Building 19 is a contributor for its association with the World War II shipbuilding effort at the yard.

[25] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

[26] "Lites" is an architectural term for individual window panes.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Building 19 is a contributor to the District, but it does not possess individual significance because it is an undistinguished utilitarian warehouse/garage building that functioned as a minor support building in the World War II-era of ship building and repair; therefore, it does not qualify for listing under the National or California Registers as an individual historical resource.[27]

Building 21 (Substation No. 5)

Building 21 stands just west of the tool room (Building 11), surrounded by two paved roads to the north and west, and a paved lot to the south and southeast, the site of infilled Slipways 5 through 8. The architect/engineer and builder of this industrial-vernacular building, constructed ca. 1900, are unknown.

DESCRIPTION

This two-story rectangular-plan building measures 101 feet 2 inches long by 75 feet 6 inches wide by 44 feet high, and contains 10,172 square feet. It has a steel frame, with corrugated metal cladding. The roof, also corrugated metal-clad, is double gable, and each gable has a wide roof monitor. The glazing consists primarily of multi-lite, double hung wood or horizontal steel sash windows, many with an operable vent sash. Many windows are covered with plywood or metal security grates; the monitor windows have been covered with corrugated metal.

The primary elevation is north; the west half features two sets of personnel doors. Two glazed metal doors at the center of the elevation lead to the Port of San Francisco's electrical storage area, and a pair of metal doors east of center leads to the radio tower control room. The east half of the north elevation features two pairs of steel freight loading doors, glazed with twelve lites per door. Two additional personnel doors open at the second level, the easternmost accessed by a metal stairway. The south elevation has two freight doors, each centered on the east and west half of the wall. A shed-roofed utility building attaches to this elevation at the southeast corner. The west elevation features a set of five hanging steel freight doors, now soldered shut. Each door is glazed with twenty-four lites.

HISTORIC/CURRENT USE

This building dates to the Risdon Iron Works period and is the only building left from that iron works. In 1911, the Risdon Yard shut down, and a subsidiary of the U.S. Steel Company purchased the yard. During World War I, the UIW Company built and operated a United States

[27] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

destroyer plant on the site of the former Risdon Yard for the Emergency Fleet Corporation. The destroyer plant was commonly known as the Risdon Plant. In 1940, during the buildup to World War II, the Navy purchased the land and built an entirely new shipyard on the site of the old Risdon Yard.

Both the 1914 and 1936 Sanborn maps show Building 21 to be a machine shop and transformer house. A 1945 Bethlehem Steel Company plan describes Building 21 as Substation No. 5 and Electric Shop No. 2. In 1945, the first floor had a compressor room in the northwest corner, and a small electric parts room east of the compressor room. Adjoining the compressor room and electrical parts room to the south was an area used for housing large equipment, including transformers. Most of eastern portion of the first floor was used as an electrical shop, with a small office in the northeast part of the floor. The second floor housed a shop in the north portion and a store room in the south. Building 21 now functions as a substation for the area and for storage. The roof was replaced in kind in 2008.

INTEGRITY

The building retains its integrity. Building 21 is a District contributor because of its association with the development and expansion of power distribution at the yard, a key component in the advancement of shipbuilding processes during the late nineteenth and early twentieth centuries.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Because Building 21 is the earliest example of steel clad construction at UIW and is the only extant example of the turn-of-the-century buildings constructed by Risdon Iron Works, and because it is the only surviving resource associated with this pioneering West Coast steel fabricator, Building 21 qualifies for individual listing in the California and National Registers under Criterion 1 and A, respectively (events that have made significant contributions to local and regional history).[28]

Building 25 (Washroom and Locker Room)

DESCRIPTION

This single-story, steel frame, gable-roofed industrial building with corrugated metal-clad walls measures 51 feet 6 inches long by 29 feet wide by 19 feet tall, and contains 1,493 square feet. Built in 1941, it stands in a courtyard created by four other buildings: 15, 16, an unnumbered mechanical building addition to 16, and 32. The northern end of Building 25 attaches to

[28] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

Building 15. A band of multi-lite, steel sash pivot and awning windows runs continuously on three exposed elevations, approximately 8 feet from the ground. Metal double doors with four-lite glazed upper panels open on the western façade. The steel Howe truss supports the gable roof.

No alterations to the plan or external materials are evident. The toilets, sinks, and urinals still line the walls, although all fittings have been removed. Most stall partitions have also been removed, as have the shower stalls near the center of the room.

HISTORIC/CURRENT USE

This building contains shower, bathroom, and locker facilities for the workers who labored in the adjacent buildings. Building 25 is one of the seven washroom and locker room facilities installed in 1941. It is the only example of a corrugated metal-clad washroom from that period, but is similar in style to the two washrooms, Buildings 110 and 119, constructed during the late 1930s. Washrooms, lockers, and lunch rooms were scattered throughout the yard as a means of providing needed amenities to the workers where they worked, a more efficient means of running a business with hundreds of workers.

INTEGRITY

Building 25 has experienced few alterations and retains integrity of location, design, setting, materials, workmanship, feeling, and association. Building 25 is a District contributor for its association with the improvement of worker amenities during World War II.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Building 25 is a contributor to the UIW Historic District, but does not possess individual significance. Building 25 is one of three architecturally similar World War II-era restroom facilities within the District. Together with Buildings 15, 16, and 32, Building 25 functioned as a support building to Building 12. The other buildings in the Building 12 complex are experienced as smaller additions rather than as separate resources. For these reasons, Building 25 does not qualify for listing under the National or California Registers as an individual historical resource.[29]

Building 32 (Template Warehouse)

Building 32 stands at the south end of the District and is part of the Building 12 complex (Buildings 12, 15, 16, 25, 32, and 66). The complex was constructed in 1941-1944, specifically for World War II as part of the New Yard. The architect and builder of this 1941 building are

[29] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

unknown. It was likely designed and built by government personnel as part of the joint World War II effort.

DESCRIPTION

This single-story, semi-attached, rectangular warehouse with a gable roof is of steel frame construction with corrugated metal-clad walls. It measures 100 feet long by 50 feet wide by 32 feet high, and contains 4,900 square feet. Its northern end attaches to Building 15. Exposed steel compound Fink trusses with a king post form the gable and create a clear interior space with no support columns. The western façade features two rows of four, evenly spaced rectangular multi-lite steel sash awning windows with steel sills. The southern façade contains vents and a metal personnel door with four window panes. Multi-lite steel sash windows can be seen on the eastern façade from the courtyard formed by the neighboring Buildings 15 and 16. Wood planking, exposed on the interior and covered with roll roofing at the exterior, clads the roof. Two prominent vents sit on the gable ridge. The interior ground floor has been repaved with asphalt, and any mechanical and/or template storage racks have been removed. Many small standard factory light fixtures remain intact.

HISTORIC/CURRENT USE

The template warehouse, Building 32, stored wooden templates used in shaping steel hull plates at the Building 12 complex. It is one of two extant template warehouses at the yard. Used in the production of multiple hulls of the same design, the templates could be reused several times. The building is currently vacant and is periodically used for temporary events.

INTEGRITY

Building 32, the template warehouse, has experienced few alterations and retains integrity of location, design, setting, materials, workmanship, feeling, and association. It contributes to the UIW Historic District for its association with the World War II shipbuilding effort at the New Yard.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Building 32 is a contributor to the UIW Historic District, but does not possess individual significance. Together with Buildings 15, 16, and 25, they functioned as support buildings to Building 12 and are experienced as smaller additions rather than as separate resources. For these

reasons, as with the other supporting resources in the Building 12 complex, Building 32 does not qualify for listing under the National or California Registers as an individual historical resource.[30]

Building 66 (Welding Shed)

Located northeast of Building 12, Building 66 marks the northern end of the Building 12 complex, a series of six buildings constructed specifically for the World War II effort (Buildings 12, 15, 16, 25, 32, and 66). The Bethlehem Steel Company's 1945 architectural plans indicate that the Federal government erected a welding platform in 1941, but the plans do not show a shed. The shed first appears in a 1945 aerial photograph. Its architect and builder are unknown.

DESCRIPTION

This large, rectangular plan, two-story, steel frame shed with corrugated metal siding measures approximately 220 feet long by 105 feet wide and covers 23,100 square feet. It is almost completely open on the north and south ends, providing an unobstructed north-south view through the building. Columns divide the space into eleven vertical bays, and Pratt trusses support the roof gable. Along the west elevation, an attached men's locker room, measuring approximately 15 feet by 60 feet, sits outside the main bay of Building 66. At some point following the period of significance, the locker room's north end sustained significant damage, with the roof torn off and the interior exposed to the elements. Two personnel doors from the locker room opened to the west and one opened to the east, into the main Welding Shed bay. Almost all interior fixtures have disappeared. Large, angled support columns for Building 66 penetrate the locker room, dividing the space into distinct bays. The locker room roof, approximately 15 feet high along the western wall, slopes down and eastward at an approximately 15 degree angle. Translucent roof panels provided interior lighting. At the east corner of the northern elevation, a sliding vehicle door on an overhead track remains, supported by horizontal beams. No other steel panels surround the door, although a personnel door opens through the vehicle door.

HISTORIC/CURRENT USE

Building 66 was used for welding pre-assemblies and other hull components during hull construction at the Building 12 complex and Slipways 5 through 8. When Building 66 was constructed in 1945 on land that was formerly part of the Pacific Rolling Mills site, most of the yard was used for the production of war vessels. This open building sheltered outdoor activities

[30] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)," December 6, 2016.

so that the welding work would not have to depend on good weather. Building 66 is currently used for vehicle storage.

INTEGRITY

Building 66 has experienced few major alterations and retains its original spatial qualities. Therefore, it retains integrity of location, design, setting, materials, workmanship, feeling, and association, and contributes to the UIW Historic District for its association with the World War II shipbuilding effort at the New Yard.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Building 66 is a contributor to the District and is one of the buildings that made up the "New Yard," but it does not possess individual significance because it functioned as a support facility for the former Slipways 5, 6, 7, and 8, and the loss of these related features has reduced the building's ability to convey its former historic function. Moreover, the building lacks individual distinction. Therefore, Building 66 does not qualify for listing under the National or California Registers as an individual historical resource.[31]

Irish Hill Remnant

DESCRIPTION

Irish Hill was originally a 70- to 100-foot-tall geological landform that once extended from the San Francisco Bay to Potrero Hill. The hillside of Irish Hill was gradually leveled with cutting and filling to expand the industrial facilities throughout the late nineteenth century. During the late nineteenth century, the hill towered over the shipyard, visually separating it from the adjacent Pacific Rolling Mills to the east. A small enclave that housed the unskilled labor force of UIW and other factories occupied the western slope. Around 1917, much of what remained of the hill was flattened and dumped into the Bay as landfill. All that remains today (the Irish Hill Remnant) is an approximately 35-foot-tall serpentine outcropping with a small stand of trees on its eastern slope in the undeveloped southwestern portion of the project site near the corner of Illinois and 22nd streets. The Irish Hill remnant is about 1.4 acres in size, representing approximately 4 percent of the entire 32-acre project site, or about 2 percent of the entire 66-acre UIW Historic District.

[31] Port of San Francisco, "Union Iron Works Historic District: Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area (includes contributing resources proposed for rehabilitation)"; December 6, 2016.

HISTORIC/CURRENT USE

By the 1880s, Irish Hill, originally Scottish Hill, was a compact neighborhood of mostly lodging houses, restaurants, and saloons that occupied the once much larger hill. Most residents were Scottish or Irish immigrant industrial workers who, despite the noise and pollution of the factories nearby, were drawn to the area because of its proximity to their places of work. Irish Hill remained a favored residential enclave for Irish immigrants until the early twentieth century, when most of the hill was flattened and used as landfill to make way for shipyard expansion.

INTEGRITY

What was once Irish Hill is represented by the remaining peak east of Illinois and 22nd streets and south of Building 117. The topography of Irish Hill was modified during the District's period of significance and expresses the struggle between lower income, worker communities, and the shipyard's desire to expand and promote itself. Because the remaining portion of Irish Hill is the last vestige of a residential enclave that served early Irish immigrant workers who were mostly employed by waterfront industry, Irish Hill contributes to the UIW Historic District. Irish Hill, in its modified form, qualifies as a contributing landscape feature that resulted from the World War I expansion of UIW, retaining all seven aspects of integrity: location, design, materials, workmanship, setting, association, and feeling.

EVALUATION OF INDIVIDUAL SIGNIFICANCE

Although the Irish Hill Remnant is associated with the UIW Historic District, of which it is a contributing feature, the remnant no longer includes any buildings, street infrastructure, or other features that are connected to the Irish Hill neighborhood, which was home to many workers at the former Union Iron Works and Pacific Rolling Mills. Moreover, the Irish Hill Remnant, while it maintains integrity of location and setting, no longer possesses integrity of material, workmanship, or feeling, nor does it have integrity of design. Accordingly, the Irish Hill Remnant is not individually eligible for the National Register of Historic Places or the California Register of Historical Resources, and is thus not an individual historical resource under CEQA.[32]

Non-Contributing Features on the Project Site

Non-contributing features of the UIW Historic District are defined as those which have either lost integrity due to substantial alterations or were constructed after the period of significance, or both.

[32] RHAA Landscape Architects, *Irish Hill Remnant: Determination of Individual Eligibility for the National Register of Historic Places and the California Register of Historic Resources*, December 8, 2016.

Slipways 5, 6, 7, and 8 were designed and built by the U.S. Navy in 1941 as part of the New Yard (Building 12 complex). Slipways 5 and 8 were 400 feet long and Slipways 6 and 7 were 660 feet long descending from the shoreline into San Francisco Bay. All are oriented east to west, and are longer than the Pier 68 slipways, allowing for the construction of larger ships. All slipways were infilled after 1964 and the associated platforms and cranes were removed. It is assumed that the subsurface portions of the craneways remain under an asphalt parking lot. The craneways and the edge of the slipways are visible along the shoreline.

Slipways 5 through 8 were installed in 1941 when the U.S. Navy constructed the Building 12 complex. The hulls were constructed in the ways before they were launched and moved over to the adjacent wet basins for outfitting. These slipways were designed to accommodate one 6,000-ton cruiser or two 2,100-ton destroyers. Welding and prefabrication were the primary methods of steel hull construction during World War II. Welding platforms were placed on all available sides of the slipways, including a larger platform at the head of Slip 8. Two head house buildings, Buildings 34 and 35, no longer extant, sat at the head of the longer slipways, Slipways 6 and 7. Instead of the 70-foot crane track towers found at Slipways 1 through 3, single Colby cranes ran on crane tracks only slightly raised above the slip ways. Rail lines and a semi-gantry crane moved plates and materials from the Building 12 complex to the slipways. This area is currently used to store self-storage lockers and new automobiles.

Slipways 5 through 8 were integral to the World War II shipbuilding process at the New Yard and were a defining feature of the layout of the Building 12 complex. These slipways were infilled and paved over in 1964, and they have lost their integrity of design, materials, workmanship, and feeling. Because of this loss of integrity, they are non-contributing features within the UIW Historic District.

HISTORIC RESOURCES OUTSIDE OF UIW DISTRICT

Other historical resources near the project site, but outside of the UIW Historic District, are located to the west and to the south.

2301 Third Street

Opposite Illinois Street to the west of the project site is the former American Can Company Building (the American Industrial Center) at 2301 Third Street. Built originally in 1920 and occupying the two city blocks bound by Third Street on the west, Illinois Street on the east, 20th Street on the north, and 22nd Street on the south, the building was determined eligible for the NRHP for its historical and architectural significance (NRHP status code “2S2”). This building is a contributor to the Central Waterfront Historic District (see discussion below).

Central Waterfront Historic District

Located directly west of the project site, on the west side of Illinois Street and centered on Third Street from 18th Street on the north to 24th Street on the south, is the Central Waterfront Historic District, which was determined eligible for the California Register of Historical Resources. This district was identified during the Central Waterfront Survey, which found that the area contains a significant concentration of mixed-use industrial properties, associated residential and commercial properties, and civic infrastructure oriented to water, railroad, and road transportation. The Central Waterfront Survey was adopted by the Landmark Preservation Advisory Board (now Historic Preservation Commission) in 2001, and later amended in 2008. The district was the epicenter of major industrial production beginning in the late 1850s, and continuing through the end of World War II. The district contains 26 contributing resources eligible for the NRHP under Criterion 1 (Events) for association with the industrial development of San Francisco from 1872 to 1958.[33]

1201 Illinois Street

Located immediately south of and adjacent to the project site is the site containing the former PG&E Station A Potrero Power Plant at 1201 Illinois Street (the PG&E Potrero Substation). Beginning in 1899, the San Francisco Gas Light Company (predecessor to today's PG&E) expanded its physical presence in Potrero Point by constructing a large power house (Station A), pump house, meter house, compressor house, and gate house on Humboldt Street to the southeast of the UIW Shipyard. Completed between 1905 and 1930, these five brick industrial structures still stand, although they are abandoned and in greatly dilapidated condition. The structures were identified in the Central Waterfront Survey and are contributors to the Central Waterfront Historic District[34] and are considered historical resources as defined by CEQA. The cluster of brick structures is located approximately 300-500 feet south from the southern boundaries of the project site. Between the project site and the five structures associated with the former PG&E Station A Potrero Power Plant are a number of intervening buildings and structures, including three modern steel former fuel storage tanks, a modern electrical substation, and modern modular buildings and trailers, none of which would be considered historical resources under CEQA.

Dogpatch Historic District

Located two blocks to the west of the project site, opposite Third Street, is the Dogpatch Historic District. Listed in Article 10 of the Planning Code as a designated San Francisco Historic District,

[33] California Department of Parks and Recreation (DPR) District Record Form, *Central Waterfront*, prepared by Kelley & VerPlanck and Page & Turnbull, Inc., March 2008.
[34] Ibid.

the Dogpatch Historic District contains approximately 75 contributing resources centered primarily on Tennessee Street. The boundaries of the district are Mariposa Street on the north, Third Street on the east, 23rd Street on the south, and Indiana Street to the west. The western boundary of the UIW Historic District, including the western boundary of the project site, is approximately 400 feet east of the Dogpatch Historic District, with numerous intervening buildings and structures, such as the former American Can Company Building and the width of Third Street. One contributor to the Dogpatch Historic District is the Irving Murray Scott School located at 1060 Tennessee Street. This two-story, wood frame schoolhouse constructed in 1895 is individually listed in the NRHP (status code "1S"), and is located approximately 650 feet west of the project site with numerous intervening buildings and streets. Aside from the UIW Historic District, the Irving Murray Scott School is the only NRHP-listed resource in the project vicinity. Dogpatch Historic District is a historical resource as defined by CEQA.

671 Illinois Street

Located to the north of the project site and immediately adjacent to the UIW Historic District is 671 Illinois Street, the historic Kneass Boatworks Building. This building is the oldest surviving wood frame boatworks building on the waterfront and dates from the 1870's. This property was determined to be individually eligible for the National Register of Historic Places by the San Francisco Planning Department in their 2001 Central Waterfront Cultural Resources Survey.

REGULATORY FRAMEWORK

This subsection describes the pertinent Federal, State, and local laws and regulations that pertain to the identification and regulation of historic architectural resources.

FEDERAL

National Register of Historic Places

The NRHP is the nation's master inventory of cultural resources worthy of preservation. It is administered by the National Park Service, which is represented at the State level by the State Historic Preservation Officer. The NRHP includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the Federal, State, or local level. Resources that are listed on or have been found by the State Historic Preservation Officer to be eligible for the NRHP are called historic properties. The NRHP provides four evaluative criteria to determine eligibility of a resource:

> The quality of significance in American history, architecture, archaeology and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and:

a. that are associated with events that have made a significant contribution to the broad patterns of history; or

b. that are associated with the lives of persons significant in our past; or

c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d. that have yielded or may likely yield information important in prehistory or history. [35]

Although there are exceptions, certain kinds of resources are not usually considered for listing in the NRHP. These include religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties that have achieved significance within the past 50 years.

Integrity

In addition to qualifying for listing under at least one of the NRHP criteria, a property must possess sufficient integrity to be considered eligible for the NRHP. According to the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*, integrity is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." The *National Register Bulletin* defines seven characteristics of integrity as follows:

Location is the place where the historic property was constructed.

Design is the combination of elements that create the form, plans, space, structure, and style of the property.

Setting addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the buildings.

Materials refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern of configuration to form the historic property.

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history.

Feeling is the property's expression of the aesthetic or historic sense of a particular period of time.

[35] 36 CFR Section 60.4.

Association is the direct link between an important historic event or person and an historic property.

STATE

Definition of Historical Resources under CEQA

CEQA Guidelines Section 15064.5(a), in Title 14 of the California Code of Regulations, defines a "historical resource" as:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources.

(2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources.

(4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

Therefore, under the CEQA Guidelines, even if a resource is not included on any local, State, or Federal register, or identified in a qualifying historical resources survey, a lead agency may still determine that any resource is a historical resource for the purposes of CEQA if there is substantial evidence supporting such a determination. A lead agency must consider a resource to be historically significant if it finds that the resource meets the criteria for listing in the CRHR.

California Register of Historical Resources Criteria

The CRHR is the authoritative guide to historical and archaeological resources that are significant within the context of California's history. Criteria for eligibility for inclusion in the CRHR are based on, and therefore correspond to, NRHP criteria for listing. A resource that meets at least

one of the eligibility criteria for inclusion in the CRHR is considered a historical resource for the purposes of CEQA. A resource is eligible for listing in the CRHR if it:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage (Events);

(2) Is associated with the lives of persons important in our past (Persons);

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values (Design/Construction); or

(4) Has yielded, or may be likely to yield, information important in prehistory or history (Information Potential).[36]

National Park Service guidance on evaluating the integrity of resources often informs the determination of eligibility under the CRHR.

LOCAL

San Francisco Planning Code Section 101.1: Master Plan Priority Policies

Planning Code Section 101.1 is generally applicable to the Proposed Project. It requires that the City find that the Proposed Project is consistent with eight master plan priority policies. Priority Policy 7 is relevant to historical resources and establishes a priority policy "that landmarks and historic buildings be preserved."

San Francisco General Plan

The Urban Design Element of the *San Francisco General Plan* includes the following policy related to historic preservation:

Policy 2.4: Preserve notable landmarks and areas of historic, architectural or aesthetic value, and promote the preservation of other buildings and features that provide continuity with past development.

Planning Department, CEQA Review Procedures for Historical Resources

The San Francisco Planning Department prepared the *CEQA Review Procedures for Historic Resources* to provide guidance in determining whether a resource is considered a historical resource as defined by CEQA.[37] Three categories of properties are defined:

[36] Public Resources Code Section 5024.1.

[37] San Francisco Planning Department, *Preservation Bulletin No. 16, CEQA Review Procedures for Historic Resources*, Draft, March 31, 2008.

- Category A. Category A has two subcategories:
    - Category A.1. Resources listed in or formally determined to be eligible for the CRHR.
    - Category A.2. Resources listed in adopted local registers, or properties that appear eligible, or may become eligible, for the CRHR.
- Category B. Properties requiring further consultation and review.
- Category C. Properties determined not to be historical resources, or properties for which the City has no information indicating that the property is an historical resource.

To determine if a property is eligible as a historical resource for the purposes of CEQA, the San Francisco Planning Department (lead agency) requires an evaluation of a property's individual significance for listing in the California Register of Historical Resources, as well as an examination of a property's relationship to any eligible historic district.

To assess impacts within historic districts, the Planning Department examines several factors including, but not limited to, size and significance of a historic district, number and location of contributing features/non-contributing features, district integrity, district boundaries, and the proposed project. Assessments within historic districts are examined on a case-by-case basis, due to the wide variety and unique nature of historical resources.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact related to historic architectural resources. Implementation of the Proposed Project would have a significant effect related to historic architectural resources if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code.

The CEQA Guidelines (Section 15064.5(b)) establish the criteria for assessing a significant environmental impact on historical resources. They state, "[a] project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." The CEQA Guidelines define "substantial adverse change" as "physical demolition, destruction, relocation, or alteration of the resource or

its immediate surroundings such that the significance of an historical resource would be materially impaired" (Section 15064.5(b)(1)).

For the purposes of this EIR, significance of a historic architectural resource is considered to be "materially impaired" and could have a potentially significant impact related to historic architectural resource if the project were to demolish or materially alter the physical characteristics that justify the inclusion of the resource in the CRHR, or that justify the inclusion of the resource in a local register, or that justify its eligibility for inclusion in the CRHR as determined by the lead agency (Section 15064.5(b)(2)).

APPROACH TO ANALYSIS

This section is based on the UIW Historic District NRHP Registration Form, an *Analysis of Proposed Demolitions Within the Union Iron Works Historic District at Pier 70*,[38] an analysis by the Port of San Francisco entitled, *Union Iron Works Historic District Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area*,[39] and certificates of determination for exemptions from environmental review and associated historical resources evaluation reports for the 20th Street Historic Core Project, Crane Cove Park, and BAE Systems Lease Renewal Projects, as well as policies and procedures undertaken by the San Francisco Planning Department. As summarized in the Environmental Setting section above, these studies included extensive background research to identify historical resources, field review, and analysis by qualified architectural historians.

As described in Chapter 2, Project Description, pp. 2.25-2.33, two project scenarios are considered in the EIR: (1) a Maximum Residential Scenario and (2) a Maximum Commercial Scenario. The Proposed Project's total gsf would range between a maximum of 4,212,230 gsf, under the Maximum Residential Scenario, to 4,179,300 gsf, under the Maximum Commercial Scenario, inclusive of new construction and rehabilitated historic buildings on the 32-acre project site inclusive of the Illinois Parcels. Under both scenarios, the Proposed Project would result in the construction of new office space, residential dwelling units, retail/restaurant/arts/light-industrial uses, and open space. Associated infrastructure, grading, and vehicle and bicycle parking would also be developed to support these uses. The two scenarios would result in new buildings that are similar in massing throughout the 32-acre project site inclusive of the Illinois Parcels; would retain and renovate the historic Buildings 2, 12, and 21; and would demolish contributing features 11, 15, 16, 19, 25, 32, and 66 and the Slipways 5 through 8 non-contributing

[38] Carey & Co., Inc., *Analysis of Proposed Demolitions Within the Union Iron Works Historic District at Pier 70.* Prepared for the Port of San Francisco, May 20, 2016.
[39] Port of San Francisco, *Union Iron Works Historic District Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area, May 16, 2016.*

features that are within the UIW Historic District. The overall gsf would be substantially the same between the two scenarios, with a difference of only approximately 32,000 gsf. The historical resources impacts and mitigations described below apply to both the Maximum Residential Scenario and the Maximum Commercial Scenario. The impacts to historical resources would be identical for the two scenarios because (1) the two scenarios would result in the rehabilitation and demolition of the same buildings (including historic buildings); (2) the building massing of the two scenarios would differ only slightly, and would create no substantial differences in the ways that the historic district and historic buildings on the site are seen or experienced; and (3) construction under both scenarios is expected to begin in 2018 and would involve five development phases over an approximately 11-year period, concluding in 2029. Construction vibration impacts on adjacent historic buildings are discussed in Section 4.F, Noise and Vibration, on pp. 4.F.41-4.F.45.

PROJECT FEATURES

Demolition, Retention, Rehabilitation, and Relocation of Existing Contributors to the UIW Historic District

The project site is within the southern portion of the UIW Historic District (south of the 20th Street alignment) and surrounds the southern portion of the adjacent 20th Street Historic Core (occupied by contributing Buildings 113, 114, 115, 116, and 14). Although the project site represents almost half of the UIW Historic District area (approximately 32 acres out of 66 total acres), it includes only 11 of the 44 contributing features within the District.

The Proposed Project would result in the demolition of seven contributing buildings on the project site that contribute to the UIW Historic District: Buildings 11, 15, 16, 19, 25, 32, and 66. These seven buildings (Buildings 11, 15, 16, 19, 25, 32, and 66) are not individually eligible for listing in the California Register of National Register.[40] The Proposed Project would retain and rehabilitate three buildings on the project site that are contributors to the UIW Historic District: Buildings 2, 12, and 21. Of these three buildings, one—Building 21—has been found to be individually eligible for listing in the California Register. Building 21would be raised approximately 4 feet, equivalent to the rest of the site, to address future sea level rise, and relocated about 75 feet from its current location. The Proposed Project would involve a minor alteration of the remnant of Irish Hill, which is a contributor to the UIW Historic District, but not individually eligible. See Figure 2.6: Proposed Rehabilitation, Retention, and Demolition Plan, in Chapter 2, Project Description, on p. 2.24. The disposition of existing buildings is summarized below in Table 4.D.3: Disposition of Contributing Features on the Project Site.

[40] Port of San Francisco, *Union Iron Works Historic District Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area, May 16, 2016.*

Table 4.D.3: Disposition of Contributing Features on the Project Site[41]

Building Number (Name)	Retain, Rehabilitate, or Demolish?
Building 2 (Warehouse No. 2)	Retain and rehabilitate
Building 11 (Tool Room and Navy Office)	Demolish
Building 12 (Plate Shop No. 2)	Retain and rehabilitate
Building 15 (Layout Yard)	Demolish[42]
Building 16 (Stress Relieving Building)	Demolish
Building 19 (Garage No. 1)	Demolish
Building 21 (Substation No. 5)	Retain, re-locate, and rehabilitate
Building 25 (Washroom and Locker Room)	Demolish
Building 32 (Template Waterhouse)	Demolish
Building 66 (Welding Shed)	Demolish
Irish Hill (remnant)	Mostly Retain

Source: ESA 2015

Infill Construction and Design for Development

The Proposed Project calls for the establishment of new infill construction zones within the project site on large expanses of existing asphalt storage areas within the UIW Historic District to the east, west, and south of the retained contributing buildings within the project site (Buildings 2, 12, and 21) and the southern portion of 20th Street Historic Core (Buildings 113, 114, 115, 116, and 14).

New construction within allowable development zones would be restricted to the total height limits by parcel name/number, as shown in Table 4.D.4: Maximum Heights of New Construction by Parcel Name/Number. The overall heights of new construction would range from 50 feet to 90 feet, responding to the variety of building heights found in the project site, which range from 44 feet (Building 21) to 60 feet (Building 12) and 82 feet (Building 2). See Figure 2.13: Proposed Height Limits Plan, on p. 2.40, which identifies the allowable new construction zones and each developable parcel. No height increase or substantial new exterior additions would be permitted at historic Buildings 2, 12, and 21.

[41] Building 117 is within the project site but is part of the adjacent 20th Street Historic Core Building 40 and 117 project, as described on p. 4.A.14. That project includes demolition of Building 117.

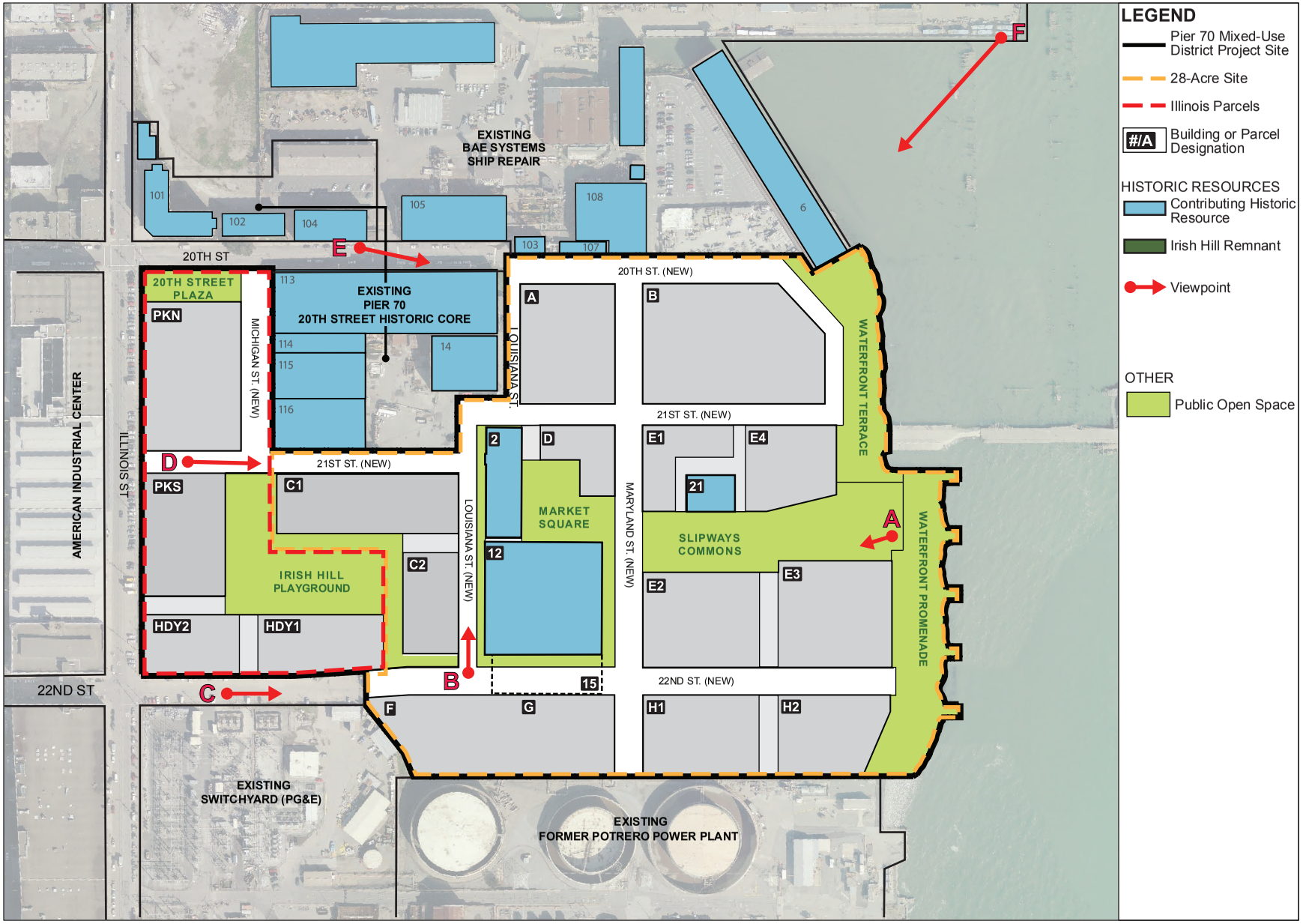
[42] The structural frame of Building 15 may be retained as part of the Proposed Project. However, for purposes of this analysis, the building is assumed to be demolished.

Table 4.D.4: Maximum Heights of New Construction by Parcel Name/Number

Parcel Name/Number	Maximum Height (feet)
A, B, D, E1 (along Maryland), C1, C2, F/G, and H1/H2	90
E2 and E3	70
E1 (along 21st), PKN, PKS, and HDY	65
E4	50

Source: ESA 2014

The following pages present a viewpoint location map (see Figure 4.D.3: Viewpoint Location Map) and six simulated views illustrating the maximum potential volume of infill construction on the project site under the proposed maximum height within the context of photographic views of the project site (see Figure 4.D.4: Maximum Height of New Infill Construction (View A); Figure 4.D.5: Maximum Height of New Infill Construction (View B); Figure 4.D.6: Maximum Height of New Infill Construction (View C); Figure 4.D.7: Maximum Height of New Infill Construction (View D); Figure 4.D.8: Maximum Height of New Infill Construction (View E); and Figure 4.D.9: Maximum Height of New Infill Construction (View F)). Note that these simulations do not depict any architectural massing, features, or materials. These simulations do not represent buildings that would be constructed. Such buildings would be sculpted and articulated, as called for under the proposed Pier 70 SUD and proposed *Pier 70 SUD Design for Development.* Architectural plans for new infill buildings in the project site would be submitted to the San Francisco Planning Department and the Port of San Francisco in future implementation of the Proposed Project, if approved, and would be reviewed for conformity with the proposed height districts and the design guidance presented in the proposed *Pier 70 SUD Design for Development*.



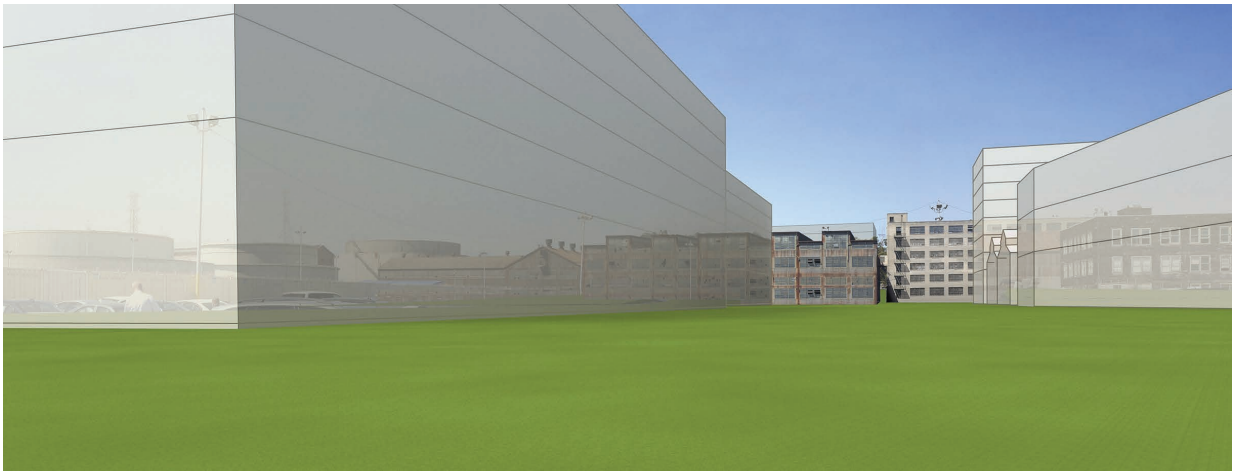
Source: Sitelab Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.3: VIEWPOINT LOCATION MAP



Existing



Proposed Representative Massing

Source: Square One (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.4: MAXIMUM HEIGHT OF NEW INFILL CONSTRUCTION (VIEW A)



Existing



Proposed Representative Massing

Source: Square One (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.5: MAXIMUM HEIGHT OF NEW INFILL CONSTRUCTION (VIEW B)



Existing



Proposed Representative Massing

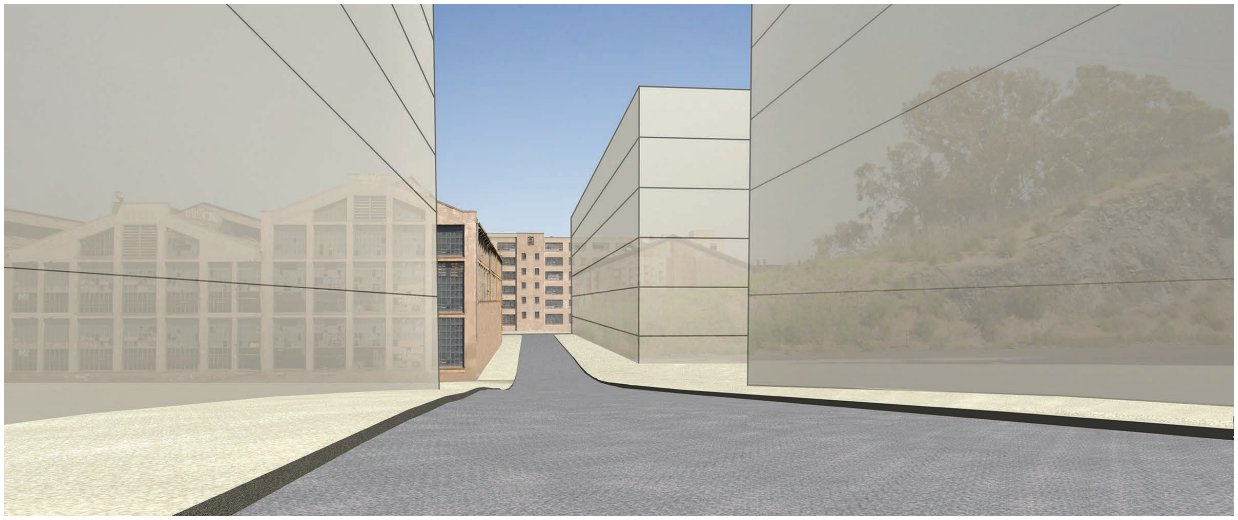
Source: Square One (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.6: MAXIMUM HEIGHT OF NEW INFILL CONSTRUCTION (VIEW C)



Existing



Proposed Representative Massing

Source: Square One (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.7: MAXIMUM HEIGHT OF NEW INFILL CONSTRUCTION (VIEW D)



Existing



Proposed Representative Massing

Source: Square One (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.8: MAXIMUM HEIGHT OF NEW INFILL CONSTRUCTION (VIEW E)



Existing



Proposed Representative Massing

Source: Square One (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.9: MAXIMUM HEIGHT OF NEW INFILL CONSTRUCTION (VIEW F)

In addition to the standards and guidelines for the rehabilitation of historic buildings, as well as the establishment of maximum building heights and buildable zones for infill construction discussed above, the *Pier 70 SUD Design for Development* also contains project-wide as well as location-specific massing and architecture requirements that would influence the design of infill construction within the Pier 70 Special Use District. Project-wide standards in the proposed *Design for Development* apply to all new construction and are intended to encourage building variety and a pedestrian scale that meets the needs of a mixed-use neighborhood. Location-specific requirements in the *Design for Development* call for increased attention to the design of the building envelope at key locations. Where new construction is located adjacent to a historic building, location-specific controls ensure architectural compatibility with historic buildings within the UIW Historic District.

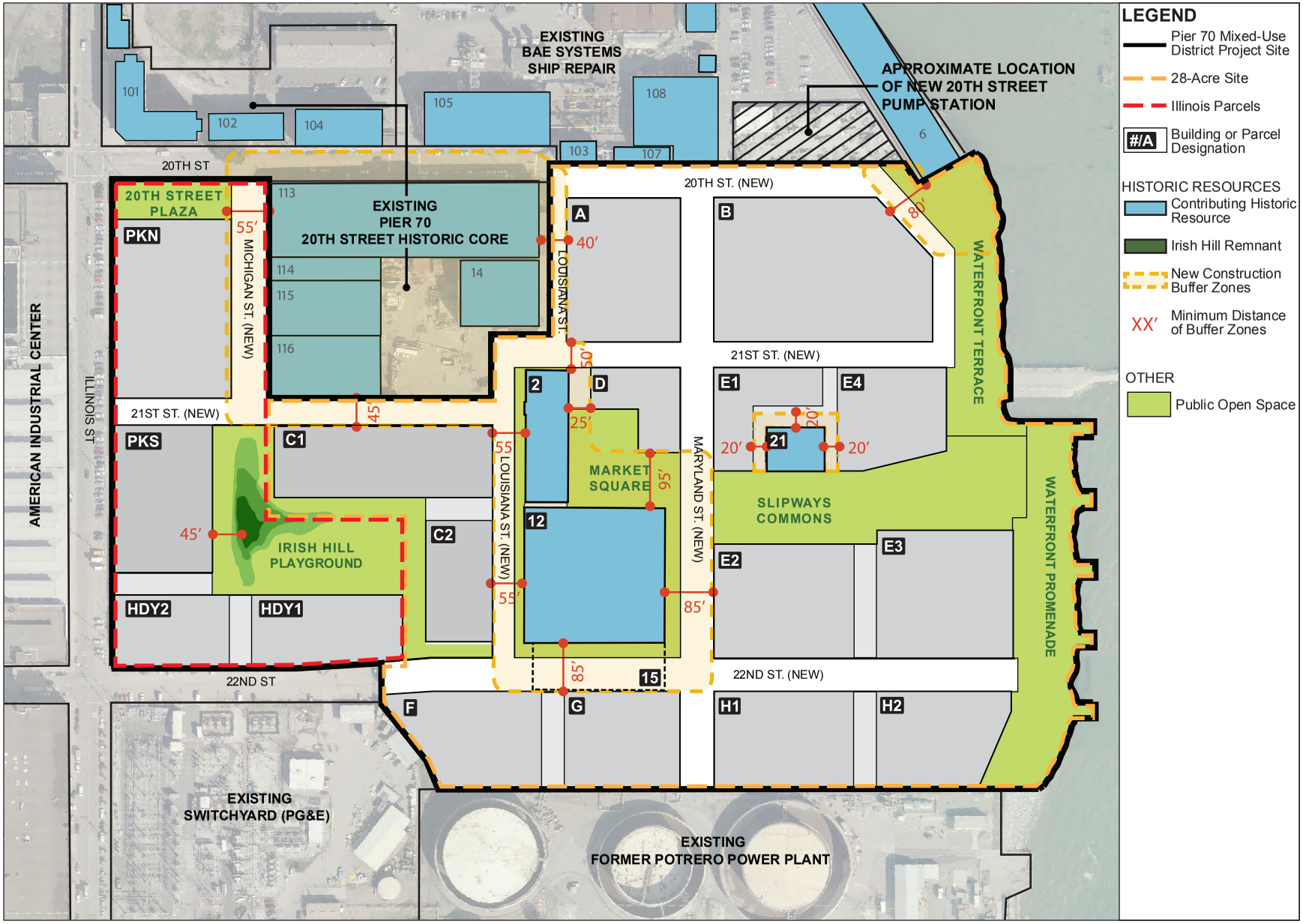
Application of the following key design features of the *Design for Development* are intended to enhance the compatibility of new infill construction with adjacent historical resources in the UIW Historic District: (1) buffer zones, (2) façades and materiality, (3) and adjacency to historical resources. Each of these project features is summarized below.

Buffer Zones

New construction would occur adjacent to historic buildings with minimum distances of separation to provide both visual and physical buffer zones, allowing the remaining historic buildings to be viewed separately from the proposed new buildings. These minimum buffer zones would range in distance from 20 to 85 feet, and would typically span the 45- to 55-foot width of existing and proposed new streets or pedestrian passageways. These buffer zones are intended to accentuate prominent views of the remaining historic Buildings 2, 12, and 21 on the project site, and historic buildings within the adjacent Historic Core site. These buffer zones also establish a minimum of 45 feet between new construction and the peak of Irish Hill. (See Figure 4.D.10: New Construction Buffer.)

Façades and Materiality

A selection of architectural strategies with regard to new building façades and materiality would draw on the District's existing forms and historic materials to enhance compatibility. Standards would prohibit false historicism, encourage building variety, and encourage façade articulation and depth. These standards would be achieved through the application of guidelines that encourage the use of historic rhythms and patterns, regional and District character, material grain, and material and color palette.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.10: NEW CONSTRUCTION BUFFER

With regard to historic rhythms and patterns, new construction would incorporate, through contemporary interpretation, one or more of the following features that draw from the District's historic character:

- Horizontal banding
- Shifted patterns/glazing
- Articulated rooflines;
- Repetitive patterns (e.g., Building 12 roofline, Building 113 windows)
- Gridded windows
- Weathered materials

(See Figure 4.D.11: Pier 70 Historic Rhythms and Patterns.)

With regard to material grain, new construction would draw on the District's use of long façades comprised of small units, such as brick and corrugated metal, as well as the District's historic use of textured and weathered materials palette (see Figure 4.D.12: Recommended Material Palette). Building façades entirely finished with smooth stucco would not be permitted. Smooth stucco would only be permitted if used in combination with other permitted building materials described in Figure 4.D.12.

Adjacency to Historic Buildings.

To enhance compatibility of new construction with adjacent historic buildings, new buildings would reference adjacent historic buildings through a range of strategies in keeping with the inherent qualities of the District, respecting its character-defining features and unique views. The design of new construction would respond to adjacent historic buildings and important views in specific locations through the use of setbacks and massing standards for view of historic Building 113; height referencing and dimensional quality; related treatment to specific historic façades; and limited or prohibited façade materials.

- *Setback and Massing Standards of Parcel A for Views of Historic Building 113*. To reflect the 60-foot height of adjacent Building 113, the massing at the northwest corner of Parcel A would be set back above 60 feet (the remainder of new construction on Parcel A would be 90 feet in height). (See Figure 4.D.13: Example Relationship of Parcel A to Historic Building 113.)



Gridded Windows



Horizontal Banding



Articulated Roofline

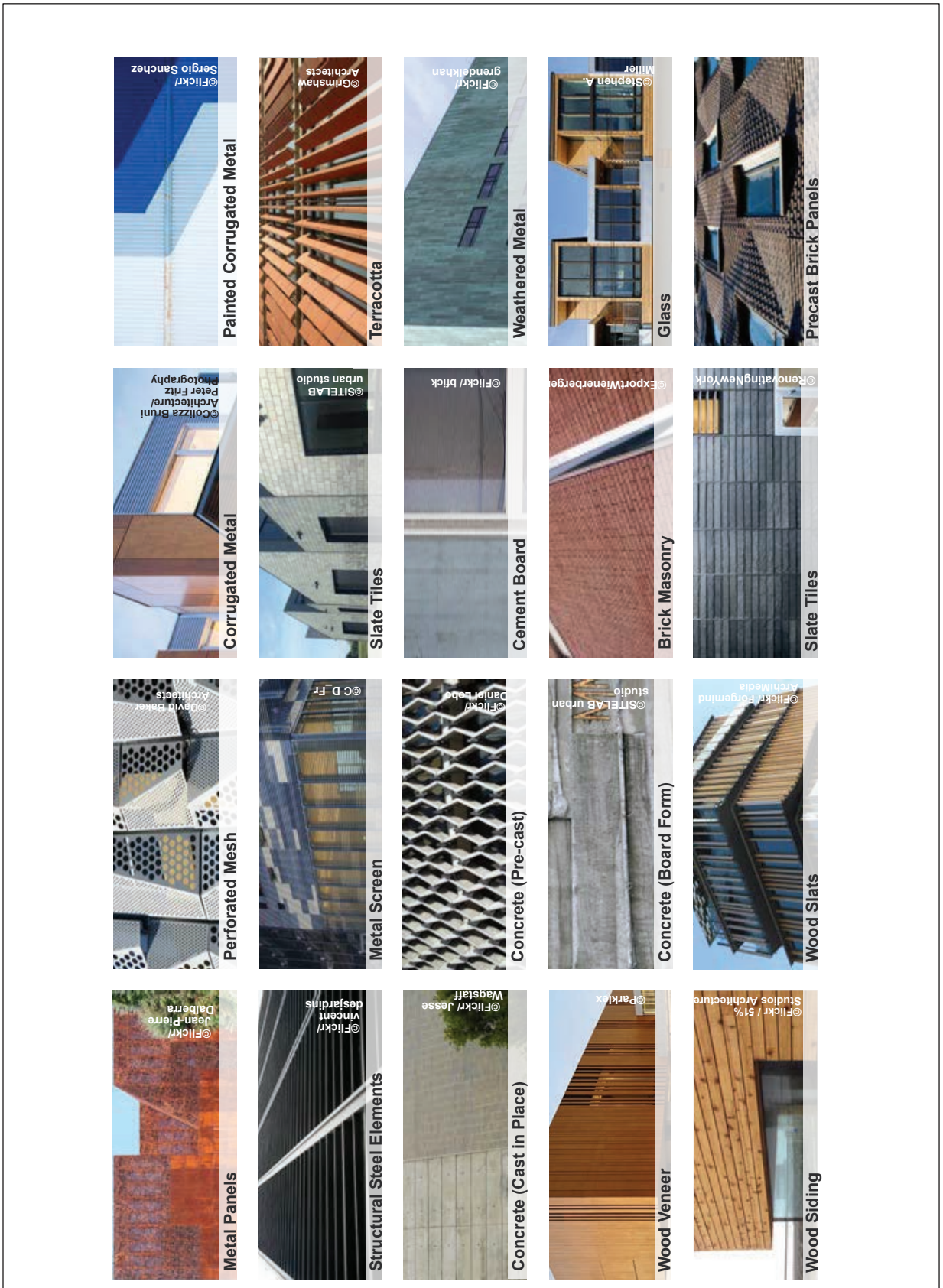


Repetitive Pattern

Source: Sitelab Urban Studio, Pier 70 Design for Development, Figure 6.8.4

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.11: PIER 70 HISTORIC RHYTHMS AND PATTERNS



Source: Sitelab Urban Studios, Pier 70 Design for Development, Figure 6.8.5

FIGURE 4.D.12: RECOMMENDED MATERIAL PALETTE

PIER 70 MIXED-USE DISTRICT PROJECT

Source: Sitelab Urban Studios, Pier 70 Design for Development, Figure 6.14.3

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.13: EXAMPLE RELATIONSHIP OF PARCEL A TO HISTORIC BUILDING 113

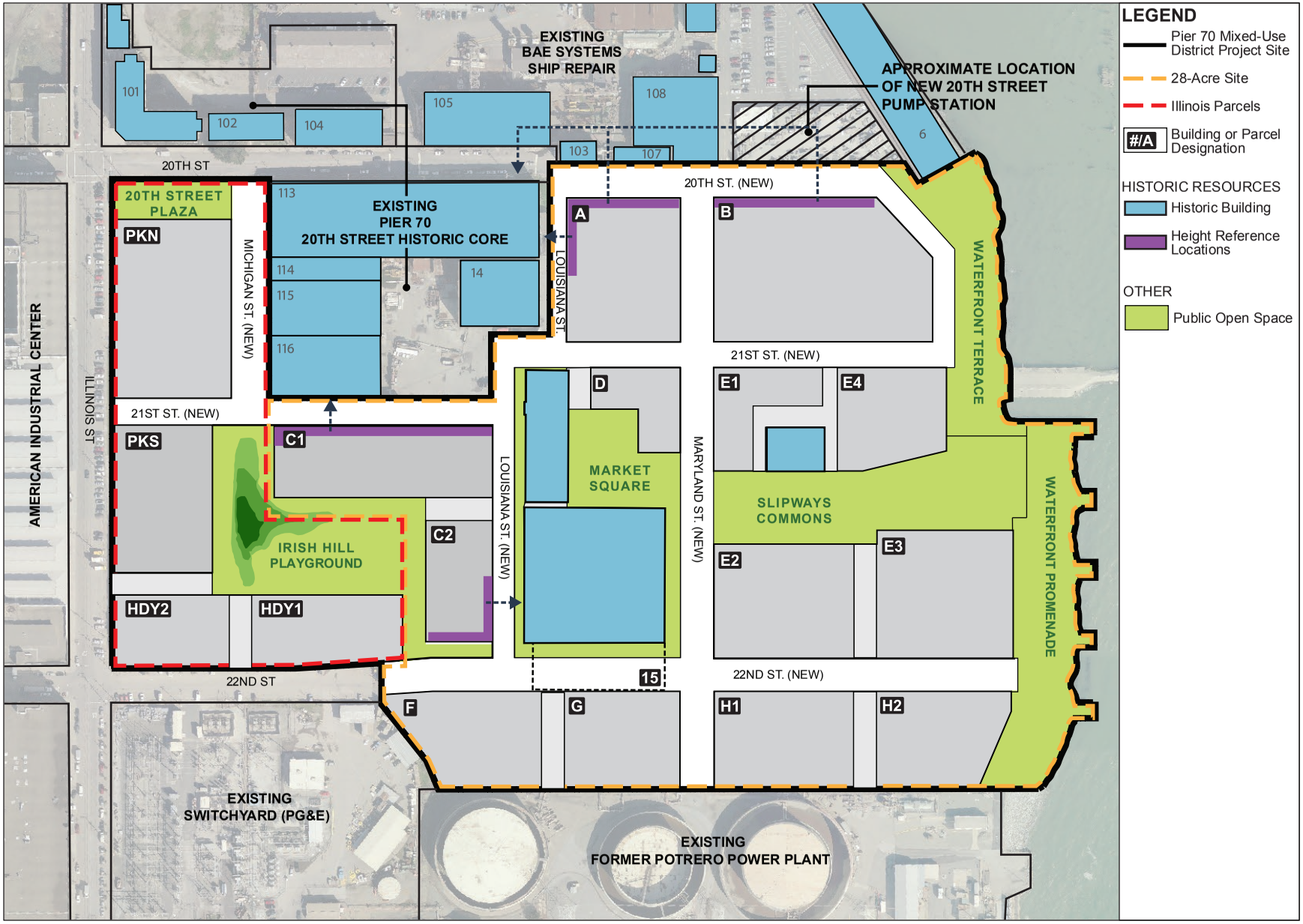
- *Height Referencing with Dimensional Quality*. To enhance compatibility of new construction with adjacent historic buildings, façades of new construction across the street from, or immediately adjacent to, historic buildings would distinctly reference the height of the adjacent building within a 5-foot height range, in order to align with the finished floors of new buildings. In order to be clearly visible, the height reference would have a dimensional quality, such that the massing would project or recess from the vertical plane through the use of distinct fenestration lines, massing, setback, or volumetric shifts, in addition to changes in the façade material or color. (See Figure 4.D.14: Height Reference Locations.)
- *Related Treatment to Adjacent Historic Buildings*. To enhance the compatibility of new construction with adjacent historic buildings, select façades of new construction would incorporate elements that relate to the adjacent historic building, in keeping with contemporary design and construction methods, including one or more of the following elements: (1) height, (2) bay rhythm/vertical modulation, (3) glazing proportions and/or pattern, (4) horizontal banding, (5) material grain, and (6) alignments with key edges or openings. This concept is visually depicted in Figure 4.D.15: Related Treatment to Adjacent Historic Resource.
- *Limited and Prohibited Façade Materials.* To enhance compatibility of new construction with adjacent historic buildings, the following materials would be limited on façades of new construction immediately adjacent to historic buildings: (1) bamboo wood, (2) smooth, flat glass curtain walls, (3) coarse-sand finished stucco, (4) highly reflective glass, and (5) wood resin panels. The following materials would be prohibited on façades of new construction immediately adjacent to historic buildings: (1) vinyl planks and siding, and (2) artificial stone or fiberglass. In addition, building façades finished entirely with solid stucco would not be permitted. Stucco could only be used in combination with other permitted building materials.

IMPACT EVALUATION

Impact CR-4: The proposed demolition of contributing buildings would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources. *(Less than Significant)*

The Proposed Project would result in the demolition of seven buildings that contribute to the significance of the UIW Historic District. These are Buildings 11, 15, 16, 19, 25, 32, and 66.

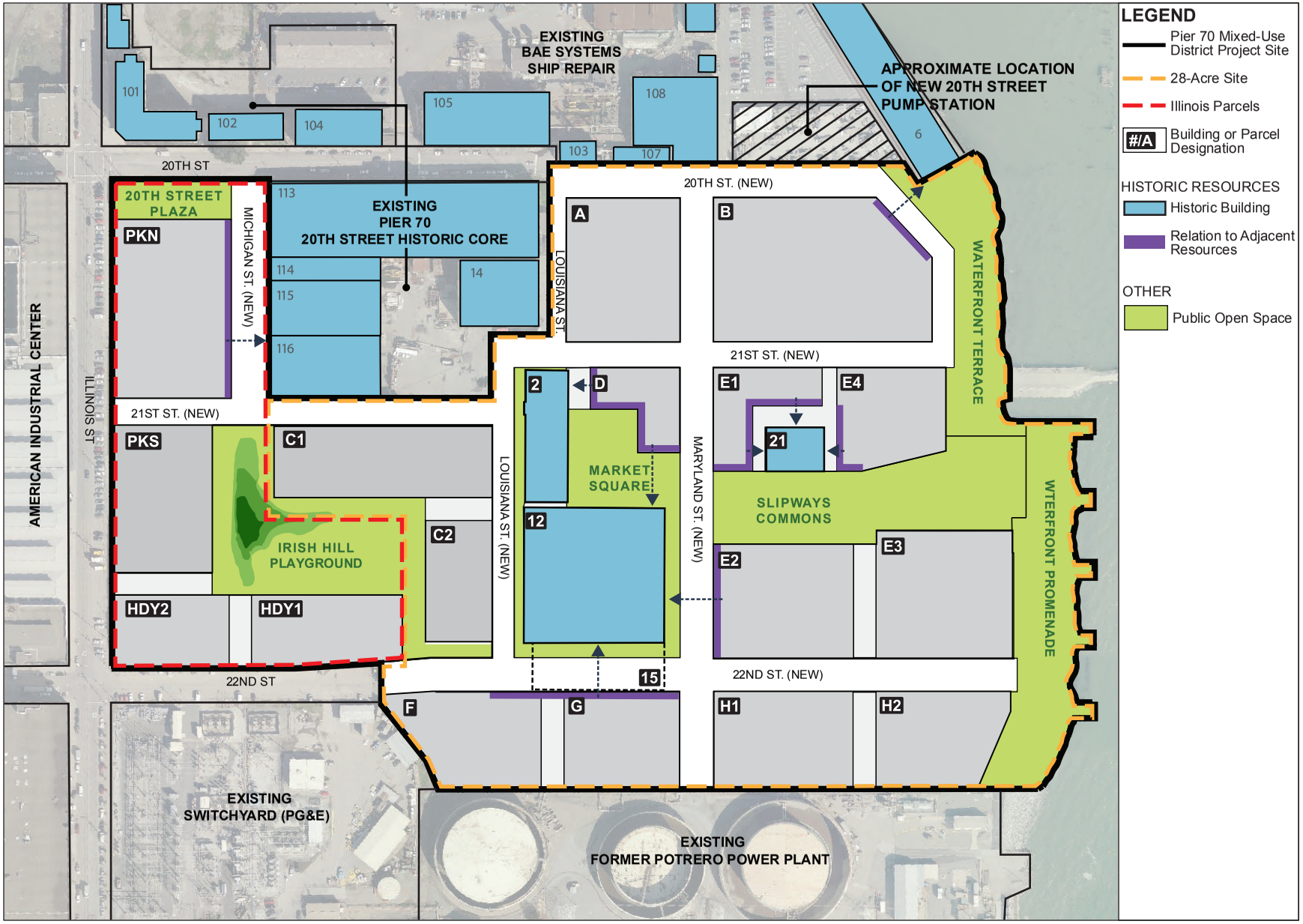
The demolition of these buildings and its effects on the integrity of the UIW Historic District were analyzed in reports prepared by Carey & Co., Inc., for the Port of San Francisco in August 2015 and by the Port of San Francisco in May 2016. The Planning Department has reviewed and concurred with the reports' findings, and the results of the analyses are presented below.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.14: HEIGHT REFERENCE LOCATIONS



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.D.15: RELATED TREATMENT TO ADJACENT HISTORIC RESOURCES

Building 11 (Tool Room and Navy Office)

Although the loss of Building 11 would affect the District's integrity, Buildings 2, 6, 12 and 21 would remain within the UIW Historic District, and the District would maintain a solid representation of this period of historical development and use (Building 6 is outside of the project site but within the UIW Historic District boundary). For these reasons, the Planning Department and the Port of San Francisco found that the proposed demolition of Building 11 would have a less-than-significant impact on the integrity of the UIW Historic District.

Building 15 (Layout Yard), Building 16 (Stress Relieving Building), Building 25 (Washroom and Locker Room), and Building 32 (Template Warehouse)

Because Buildings 15, 16, 25, and 32 are experienced as one structure, they were examined collectively within the Building 12 complex rather than individually to determine the impact of demolition on the integrity of the UIW Historic District. The proposed demolition of these buildings is in part necessitated by the proposed rehabilitation of Building 12, the center of this building complex and its most significant and dominant structure, which was determined to be individually eligible for listing in the California Register. The Proposed Project would remove the abutting buildings so that Building 12 becomes freestanding (see the discussion of the impacts of rehabilitation efforts, below). Demolition of Buildings 15, 16, 25, and 32 is also proposed in order to extend 22nd Street eastward toward the Bay to improve vehicular and pedestrian access to this area of the Historic District and shoreline as well as to serve the needs of existing activities and proposed new infill development. A project option would retain the structural frame of Building 15; however, the removal of all other portions of this building would be treated as a *de facto* demolition.

Although the loss of these contributing buildings would diminish the integrity of the southern portion of the UIW Historic District, the loss would not be significant when considered on a District-wide basis because Buildings 6, 14, 49, and 110 (outside of the project site but within the UIW District) would be retained and would provide a significant concentration of better examples of these World War II resource types. For these reasons, the Planning Department and the Port of San Francisco found that the proposed demolition of Buildings 15, 16, 25, and 32 would have a less-than-significant impact on the integrity of the UIW Historic District.

Building 19 (Garage No. 1)

Building 19, a modest-scale steel frame corrugated metal garage/warehouse structure, would be demolished due to the proposed extension of 20th Street eastward toward the Bay. This proposed vehicular and pedestrian access would be required to serve the needs of the existing activities in the northeast portion of the project site, as well as to support future infill development. The Port's

development strategy directed new infill development to this largely open and vacant area of the UIW Historic District to minimize the loss of contributing features to maintain the District's historic character to the north and west where significant groupings of resources are located.

The integrity of the UIW Historic District would not be significantly impacted by the loss of this contributor because the UIW Historic District would continue to convey its significance and association with utilitarian steel frame and corrugated metal warehouse development from World War II. Similar modest to large warehouses would remain, including Buildings 6, 12, and 14 (Buildings 6 and 14 are outside of the project site but within the UIW Historic District boundary). For these reasons, the Planning Department and the Port of San Francisco found that the proposed demolition of Building 19 would have a less-than-significant impact on the integrity of the UIW Historic District.

Building 66 (Welding Shed)

Building 66 is a simple utilitarian facility that provided weather protection for welding pre-assemblies and other hull components associated with hull construction at the Building 12 complex. The proposed street network to serve the existing activities and proposed new infill development necessitates the removal of Building 66.

Although the building supports the UIW Historic District's ability to convey activities associated with the production of war vessels during World War II, other remaining buildings of this construction type would continue to convey the UIW Historic District's significance associated with World War II, including Buildings 6 and 14 (outside of the project site but within the UIW Historic District boundary). For these reasons, the Planning Department and the Port of San Francisco found that the proposed demolition of Building 66 would have a less-than-significant impact on the integrity of the UIW Historic District.

Conclusion

In summary, Carey & Co., Inc. found, and the Planning Department and Port of San Francisco (in its capacity as the proponent of the UIW National Register Historic District nomination) concur, that a significant concentration of World War II-era contributing features would remain in the Historic District. They would continue to provide strong visual and physical examples of the World War II era of the UIW Historic District. In many instances, the structures to be demolished are repeated elsewhere in the Historic District, as is the case with World War II warehouses, restrooms, and electrical power substations. Additionally, the proposed loss of these resources would not result in the need to adjust the boundary, because the boundary represents the historic ownership and maximum development of the District at its peak operation during World War II.

The boundary for the UIW Historic District, as with most historic districts, includes areas with non-contributing features.

The Proposed Project would result in the demolition of contributors to the UIW Historic District. For the reasons stated above, the proposed demolitions would not result in a substantial adverse change in the historic significance of the UIW Historic District, nor would they result in a deleterious effect on most of the District's character-defining features. The UIW Historic District would retain sufficient contributing features, character-defining features, and overall integrity to continue its listing in the NRHP and the CRHR. As such, the demolition of contributing Buildings 11, 15, 16, 19, 25, 32, and 66 would not materially impair the physical characteristics that justify the UIW Historic District's inclusion in the NRHP or the CRHR.

None of the seven contributing buildings proposed for demolition were found to be individually eligible for listing in the NRHP or CRHR because they either functioned as support facilities to the primary shipbuilding or repair processes, are viewed as smaller additions to the primary buildings or functions, have compromised integrity because the understanding of their role in the shipbuilding process was reduced from the loss of other related facilities, or represent utilitarian buildings that are repeated elsewhere in the District.

Although demolition of contributing Buildings 11, 15, 16, 19, 25, 32, and 66 would have a less-than-significant impact on individual historical resources identified in this EIR and the UIW Historic District as a whole, implementation of Improvement Measure I-CR-1a: Documentation and I-CR-b: Public Interpretation, which call for the documentation and interpretation of the UIW Historic District for the general public, would further reduce the less-than-significant impact resulting from the proposed demolition of contributing features.

Improvement Measure I-CR-4a: Documentation

Before any demolition, rehabilitation, or relocation activities within the UIW Historic District, the project sponsors should retain a professional who meets the Secretary of the Interior's Professional Qualifications Standards for Architectural History to prepare written and photographic documentation of all contributing buildings proposed for demolition within the UIW Historic District. The documentation for the property should be prepared based on the National Park Service's Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) Historical Report Guidelines. This type of documentation is based on a combination of both HABS/HAER standards and National Park Service's policy for photographic documentation, as outlined in the NRHP and National Historic Landmarks Survey Photo Policy Expansion.

The written historical data for this documentation should follow HABS/HAER standards. The written data should be accompanied by a sketch plan of the property. Efforts should also be made to locate original construction drawings or plans of the property during the period of significance. If located, these drawings should be photographed, reproduced,

and included in the dataset. If construction drawings or plans cannot be located, as-built drawings should be produced.

Either HABS/HAER-standard large format or digital photography should be used. If digital photography is used, the ink and paper combinations for printing photographs must be in compliance with NR-NHL Photo Policy Expansion and have a permanency rating of approximately 115 years. Digital photographs should be taken as uncompressed, TIFF file format. The size of each image should be 1,600 by 1,200 pixels at 330 pixels per inch or larger, color format, and printed in black and white. The file name for each electronic image should correspond with the index of photographs and photograph label. Photograph views for the dataset should include (a) contextual views; (b) views of each side of each building and interior views, where possible; (c) oblique views of buildings; and (d) detail views of character-defining features, including features on the interiors of some buildings. All views should be referenced on a photographic key. This photographic key should be on a map of the property and should show the photograph number with an arrow to indicate the direction of the view. Historic photographs should also be collected, reproduced, and included in the dataset.

The project sponsors should transmit such documentation to the History Room of the San Francisco Public Library, and to the Northwest Information Center of the California Historical Information Resource System. The project sponsors should scope the documentation measures with Planning Department Preservation staff. Department Preservation staff should also review and approve the submitted documentation for adequacy.

Improvement Measure I-CR-4b: Public Interpretation

Following any demolition, rehabilitation, or relocation activities within the project site, the project sponsors should provide a permanent display(s) of interpretive materials concerning the history and architectural features of the District within publicly accessible areas of the project site. The content of the interpretive display(s) should be coordinated and consistent with the sitewide interpretive plan prepared for the 28-Acre Site in coordination with the Port. The specific location, media, and other characteristics of such interpretive display(s) should be presented to Planning Department preservation planning staff for review and comment and to Port preservation staff for approval prior to any demolition or removal activities.

Impact CR-5: The proposed rehabilitation of Buildings 2, 12, and 21 would materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources and would materially alter the physical characteristics of Building 21 that justify its individual eligibility for inclusion in the California Register of Historical Resources. *(Less than Significant with Mitigation)*

Buildings 2, 12, and 21 would be rehabilitated under the Proposed Project for a range of possible reuse purposes. Prior to Port issuance of building permits, the City and the Port of San Francisco would require the project sponsors to rehabilitate Buildings 2, 12, and 21 in accordance with the Secretary of the Interior's Standards for Rehabilitation (Secretary's Standards). As noted in

CEQA Section 15064.5(a)(3), "a project that follows the Secretary of the Interior's Standards for the Rehabilitation and Guidelines for Rehabilitating Historic Buildings … shall be considered as mitigated to a level of less-than-significant impact on the historical resource."

As the rehabilitation efforts for these buildings are still in the design phase, the Planning Department conservatively finds that the impact of the proposed rehabilitation to Buildings 2, 12, and 21 to be significant. Implementation of Mitigation Measure M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria, shown below, would reduce the impacts of rehabilitation on the UIW Historic District to a less-than-significant level.

Implementation of Mitigation Measure M-CR-5 would also ensure that the rehabilitation of Building 21 would not materially impair the physical characteristics of Building 21 that justify its individual eligibility for the California Register of Historical Resources.

Mitigation Measure M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria.

Prior to Port issuance of building permits associated with Buildings 2, 12 and 21, Port of San Francisco Preservation staff shall review and approve future rehabilitation design proposals for Buildings 2, 12, and 21. Submitted rehabilitation design proposals for Buildings 2 and 12 shall include, in addition to proposed building design, detail on the proposed landscaping treatment within a 20-foot-wide perimeter of each building. The Port's review and analysis would be informed by Historic Resource Evaluation(s) provided by the project sponsors. The Historic Resource Evaluation(s) shall be prepared by a qualified consultant who meets or exceeds the Secretary of the Interior's Professional Qualification Standards in historic architecture or architectural history. The scope of the Historic Resource Evaluation(s) shall be reviewed and approved by Port Preservation and Planning Department Preservation staff prior to the start of work. Following review of the completed Historic Resource Evaluation(s), Planning Department preservation staff would prepare one or more Historic Resource Evaluation Response(s) that would contain the Department's determination as to the effects, if any, on historical resources of the proposed renovation. The Port shall not issue building permits associated with Buildings 2, 12, and 21 until Planning Department and Port preservation staff concur that the design (1) conforms with the Secretary of the Interior's Standards for Rehabilitation; (2) is compatible with the UIW Historic District; and (3) preserves the building's historic materials and character-defining features, and repairs instead of replaces deteriorated features, where feasible. Should alternative materials be proposed for replacement of historic materials, they shall be in keeping with the size, scale, color, texture, and general appearance. The performance criteria shall ensure retention of the following character-defining features of each historic building:

- **Building 2**: (1) board-formed concrete construction; (2) six-story height; (3) flat roof; (4) rectangular plan and north-south orientation; (5) regular pattern of window openings on east and west elevations; (6) steel, multi-pane, fixed sash windows (floors 1-5); (7) wood sash windows (floor 6); (8) elevator/stair tower that rises above roofline and projects slightly from west façade.

- **Building 12**: (1) steel and wood construction; (2) corrugated steel cladding (except the as-built south elevation, which was always open to Building 15); (3) 60-foot height; (4) Aiken roof configuration with five raised, glazed monitors; (5) clerestory multi-lite steel sash awning windows along the north and south sides of the monitors; (6) multi-lite, steel sash awning widows, arranged in three bands (with a double-height bottom band) on the north and west elevations, and in four bands on the east elevation; (7) 12-bay configuration of east and west elevations; (8) north-south roof ridge from which roof slopes gently (1/4 inch per foot) to the east and west.
- **Building 21:** (1) steel frame construction; (2) corrugated metal cladding; (3) double-gable roof clad in corrugated metal, with wide roof monitor at each gable; (4) multi-lite, double hung wood or horizontal steel sash windows[43]; and (5) two pairs of steel freight loading doors on the north elevation, glazed with 12 lites per door.

Planning Department staff and Port staff shall not approve any proposal for rehabilitation of Buildings 2, 12, and 21 unless they find that such a scheme conforms to the Secretary's Standards as specified for each building.

Impact CR-6: The proposed relocation of contributing Building 21 would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources, nor the physical characteristics of Building 21 that justify its eligibility for individual inclusion in the California Register of Historical Resources. *(Less than Significant)*

In addition to being rehabilitated, Building 21 would be relocated approximately 75 feet to the southeast to accommodate the proposed extension and rationalization of new streets, to provide sufficient room for new infill construction in the immediate vicinity, to front the new public park, and to accommodate the proposed increase in the elevation grade. Building 21 would also be raised approximately 4 feet, equivalent to the rest of the site, to accommodate the potential for sea level rise.

Relocated buildings can remain eligible for the NRHP if they satisfy NRHP Criteria Consideration B, which states that "A property removed from its original or historically significant location can be eligible if it is significant primarily for architectural value or it is the surviving property most importantly associated with a historic person or event."[44] Building 21 appears to qualify on both fronts, because it is significant for its industrial architecture and it would be considered the building "most importantly associated" with Risdon Iron Works' presence on the site. In addition to these requirements, to satisfy Criteria Consideration B, moved

[43] Many of the building's windows have been covered with plywood or metal security grates; the monitor windows have been covered with corrugated metal.

[44] U.S. Department of the Interior, National Park Service, Interagency Resources Division, How to Apply the National Register Criteria for Evaluation, Washington, D.C.: 1991, p. 29.

properties must retain an "orientation, setting, and general environment that are comparable to those of the historic location and that are compatible with the property's significance."[45]

Building 21's relocation would preserve its orientation. More generally, its context and spatial relationship to Buildings 2 and 12 would be maintained. Relocating Building 21 to the south would enable all three historic buildings to be viewed simultaneously from proposed future open space. The proposed relocation would emphasize the south wall of the building (historically the building's rear elevation), which would front the new open space, whereas the building's historic front (north) façade would be separated from proposed new Building E1 by a narrow pedestrian alley. The proximity of the north façade to other buildings, however, is in keeping with the building's historic condition. As a result, the proposed relocation of Building 21 would satisfy NRHP Criteria Consideration B and the building would remain a contributor to the UIW Historic District.

The relocation of Building 21 would not substantially affect this building's integrity of setting as a contributor to the UIW Historic District, and as a resource that is eligible for individual inclusion in the California Register of Historical Resources, because it would be within the same general location as its historic context and the spatial relationship of Buildings 2, 12 and 21 would be largely maintained. For these reasons, the proposed relocation of Building 21 would have a less-than-significant impact on historical resources. No mitigation measures are necessary.

Impact CR-7: The proposed demolition of non-contributing slipways would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources. *(Less than Significant)*

The Proposed Project would demolish or substantially alter Slipways 5, 6, 7, and 8 (remnant slipways), which are non-contributors to the UIW Historic District. Because Slipways 5 through 8 do not contribute to the UIW Historic District and are not otherwise considered historical resources as defined by CEQA, their removal or substantial alteration would have a less-than-significant impact on historical resources. No mitigation measures are necessary.

Impact CR-8: The proposed site grading work associated with contributing Buildings 2 and 12 would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources. *(Less than Significant)*

The grade around Buildings 2 and 12 would be raised approximately 4 feet to protect these buildings from potential sea level rise, according to the Proposed Project's site grading plan. The

[45] How to Apply the National Register Criteria for Evaluation, p. 30.

effects of the grading plan relative to historic Buildings 2 and 12, as well as the UIW Historic District as a whole, are discussed below.

Building 2

The first floor of Building 2 has a podium level approximately 5 feet above the ground to accommodate the loading docks that encircle the building. The placement of up to 4 feet of new soil surrounding this building, thereby raising the ground level to approximately 1 foot below the top of the loading docks, would not substantially change the building's character-defining features (identified in Mitigation Measure M-CR-5, pp. 4.D.93-4.D.94, above). While the new grade would result in a relatively minor change in building height relative to the overall height of this building, and would have a minor impact on the property's integrity, it would not materially impair the significance of Building 2 as a contributor to the UIW Historic District. For these reasons, the proposed grading plan would have a less-than-significant impact on this contributor to the UIW Historic District. No mitigation measures are necessary.

Building 12

Three options for the grading treatment of Building 12 relative to the proposed grading plan are included in the Proposed Project. The final grading treatment would ultimately be decided on before the Port issues building permits, subject to review and approval of the San Francisco Planning Department.[46] Each of these options is described below, including overall impacts on the significance of the building and consistency with the Secretary of the Interior's Standards.

Grading Option 1: Raise the Exterior Grade Only

Under Grading Option 1, Building 12 would remain at the current finished floor elevation. A grade differential of no more than 4 feet between the finished floor elevation of Building 12 and the surrounding street elevation would be bridged by stepped or sloped treatment of the area adjacent to the building, allowing the exterior wall to remain fully exposed. No changes to the interior floor elevation would occur under this option. While the new grade would have a minor impact on the property's integrity of setting, as all exterior, character-defining features of Building 12 would remain visible and unchanged from current conditions, this option would not materially impair the significance of Buildings 12 to the extent that it would no longer be a contributor to the UIW Historic District. Grading Option 1 would meet the Secretary of the Interior's Standards for Rehabilitation because it would retain and preserve the building's

[46] The frame of Building 15, which is included in the Building 12 complex, would remain in place as part of the Proposed Project. Because the impacts to Building 15 are analyzed separately under Impact CR-1, only the impacts of the grading plan on Building 12 are analyzed in this subsection.

character-defining features. For these reasons, Option 1 of the proposed grading plan would have a less-than-significant impact on Building 12. No mitigation measures are necessary.

Grading Option 2: Raise the Interior Slab on Grade of Building 12 Structural Frame and Raise the Exterior Grade

Under Grading Option 2, the interior slab would be raised up to a maximum of 3 feet and the adjacent exterior would be raised an additional 4 feet, while leaving the existing structure at the current elevation. The new slab on grade would be placed over compacted fill, and a thickened edge of slab would be placed around the building perimeter. Up to 4 feet of differential grading between the street elevation and the new floor slab would be bridged by stepped or sloped treatments. This option would cover some currently exposed steel column-to-foundation connections, shorten the height of pedestrian and vehicular openings, and lower the sill heights of ground-floor windows, as viewed from the interior. Although the first 4 feet of the exterior elevations of Building 12 could be obscured from view due to the raised interior grade, this would represent a relatively minor loss of historic fabric, or approximately 6 percent, of the overall 60-foot-tall elevation of Building 12, and would be minimally perceptible given the building's relatively massive (60,000-square-foot) floor plate. While the new grade would have a minor impact on the property's integrity of setting, Grading Option 2 would meet the Secretary of the Interior's Standards for Rehabilitation because it would retain and preserve the vast majority of the building's character-defining features. For these reasons, Option 2 of the proposed grading plan would have a less-than-significant impact on Building 12. No mitigation measures are necessary.

Grading Option 3: Raise Building 12 Structural Frame

Under Grading Option 3, Building 12 would be raised approximately 3 feet and placed on new slab foundations at the new grade elevation. The surrounding grade would gradually slope away from the buildings as needed for drainage purposes. This option would entail disconnecting the structural steel columns from the foundations by unbolting the existing anchor bolts, then incrementally jacking up the building columns to the desired elevation. Although the building would be higher than under current conditions, all exterior, character-defining features of Building 12 would remain visible and generally unchanged from current conditions. This option would not materially impair the significance of Building 12 as a contributor to the UIW Historic District. While the new grade would have a minor impact on the property's integrity of setting, Grading Option 3 would meet the Secretary of the Interior's Standards for Rehabilitation because it would retain and preserve the vast majority of the building's character-defining features. For these reasons, Option 3 of the proposed grading plan would have a less-than-significant impact on Building 12. No mitigation measures are necessary.

Impacts of the Grading Plan on the UIW Historic District

The grading plan indicates that portions of the project site within the UIW Historic District would be raised up to approximately 5 feet to accommodate the potential for future sea level rise, while still meeting existing grade at 20th Street and in areas adjacent to the 20th Street Historic Core. Because most of the District is currently a relatively flat, paved, and developed area, the increase in elevation of up to approximately 5 feet under the grading plan would retain its generally flat and developed appearance. The increased elevation would be a relatively minor alteration that would be nearly imperceptible from a District-wide perspective. While the new grade would have a minor impact on the District's integrity of setting, implementation of the grading plan would meet the Secretary of the Interior's Standards for Rehabilitation because it would retain and preserve the vast majority of the District's character-defining features. As such, implementation of the grading plan would result in a less-than-significant impact to the UIW Historic District as a whole. No mitigation measures are necessary.

Impact CR-9: The proposed alteration of Irish Hill, a contributing landscape feature, would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources. ***(Less than Significant)***

The 35-foot-tall remnant[47] of Irish Hill is a contributing landscape feature of the UIW Historic District. All but a small portion of the remnant of Irish Hill would be retained, and the adjacent areas to the south and east would be improved as a public open space (Irish Hill Playground). It would become a central landscape feature surrounded by proposed new streets and infill construction (see Figure 2.15: Proposed Open Space Plan, in Chapter 2, Project Description, p. 2.46). A minimum buffer zone of 45 feet would be established between the peak of Irish Hill and new development to the west (Parcel PKS). New benches and plantings and a playground area would be installed south of the hill's edges, but no changes would occur to the side slopes or top of the hill. Approximately 0.04 acre, or 1,900 square feet, out of the hill's total 1.4 acres, or 60,984 square feet (representing 3 percent of the total area), would be removed to accommodate the proposed extension of 21st Street. Further, the area proposed for removal is of relatively low elevation (as compared to other areas of the hill) and therefore would not significantly alter perception of the remnant of Irish Hill's height and mass. Irish Hill appears as a lightly vegetated serpentine outcropping, with distinctive rocky exposure on the western and southern faces. The area proposed for removal is of similar aesthetic quality to the area proposed to be retained. The Proposed Project does not propose to alter the distinctive rocky exposure on the western and southern faces. The removal of 3 percent of the hill, at an area of relatively low elevation, is

[47] Only about 1.4 acres of the original 20.6 acres of the original Irish Hill remain today.

considered a relatively minor loss, and because approximately 97 percent of this important landscape feature would be retained, this portion of the Proposed Project would not materially impair the integrity of the resource as a contributing landscape feature of the UIW Historic District. The construction of new public streets and new development adjacent to Irish Hill, as well as new benches and plantings and a playground south of the hill, would alter the feeling and association of the resource, but would not reduce its overall integrity to the extent that the Irish Hill remnant would no longer remain a contributor to the UIW Historic District. Therefore, the removal of a portion of Irish Hill and the construction of adjacent new development would have a less-than-significant impact to the integrity of Irish Hill, and to the UIW Historic District as a whole. No mitigation measures are necessary.

Impact CR-10: The proposed changes and additions to the network of streets and open space would not materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources. ***(Less than Significant)***

The proposed street network would extend the existing east-west streets (20th Street and 22nd Street), establish a new east-west street (21st Street) westward through the project site to the shoreline of the Bay, and create north-south internal streets. The Proposed Project would also provide a 9-acre interconnected network of public open spaces through the project site.

As discussed above on p. 4.D.44, the UIW Historic District designation identifies the following character-defining features within existing streets and spaces between buildings: minimal planted vegetation; open areas that are either paved with asphalt or covered with gravel; streets that are improved without curbs and gutters, except for 20th Street, which has granite curbs.[48]

The proposed network of streets and open space is intended to create visual and physical access along proposed streets and open space view corridors to the cluster of historic buildings, located both within the project site and the adjacent 20th Street Historic Core that would become the central historic core for surrounding new infill development within the project site, as well as connecting the core to a new, publicly accessible waterfront.

The proposed network of streets would establish a hierarchy of public rights-of-way to provide access and connectivity throughout the project site, building upon the existing neighborhood street grid and creating continuity through the site and to the waterfront. The proposed open space system would similarly provide enhanced access through the site and connectivity to the waterfront. For example, a continuous waterfront park ("Waterfront Terrace" and "Waterfront

[48] United States Department of the Interior, National Park Service, National Register of Historic Places Registration Form, *Union Iron Works Historic District*, April 17, 2014.

Promenade") would extend the length of the shoreline, with an extension of the park ("Slipways Commons") toward the site's interior, linking the waterfront to the historic Buildings 2, 12, and 21 and a proposed new plaza (Building 12 Market Plaza and Market Square). The waterfront park would incorporate the former slipways and craneways into the design of the Waterfront Promenade as way to reference the former industrial uses in this area of the District. For example, craneways that protrude from the shoreline into the Bay would be preserved as piers, and the craneways would be made accessible to the public. The open space framework would also retain the hilltop remnant of Irish Hill in its current state, while constructing a playground to the west of it and connecting this area to the rest of the open space system through vegetated pathways between new buildings on Parcels PKS, HDY1 and HDY2. Another component of the open space system, the proposed plaza (20th Street Plaza) at Illinois Street and 20th Street, would allow for expansive views of historic Building 113 from the corner of Illinois Street and 20th Street, and would serve as a gateway to the District, further integrating it with the existing neighborhood to the west.

Historically, Pier 70 was characterized by minimal to no vegetation, which is typical for waterfront industrial uses. This condition is a character-defining feature of the UIW District. To facilitate the transition to a new neighborhood, the *Pier 70 SUD Design for Development* calls for street trees to be planted in appropriate locations with grasses and other plantings to create the benefit of new landscape compatible with the historic character of the UIW Historic District. For example, street trees would be installed along the proposed waterfront extension of 20th Street and 22nd Street at the waterfront and southern perimeter of the district, and along some of the proposed interior north-south streets away from contributing features of the district. However, no street trees are proposed along 20th street in the project site. The installation of street trees only in some areas is intended to strike a balance between the limited vegetation currently found in the UIW Historic District and the aesthetic desires for the successful adaptive reuse of the project site. The proposed landscaping within the open space system would also consist of an "enhanced native" palette, reflective of the post-industrial organic wild grasses growing at the site today. The palette would include species native to San Francisco and the Bay Area and non-native, non-invasive, and salt- and drought-tolerant species appropriate for the urban waterfront setting.

The proposed network of streets and open space would reinforce and enhance the visual, historical, and functional connection between contributing buildings and the Bay, which is one of the District's primary character-defining features.

Other character-defining features of the District include streets without curbs and gutters, except for 20th Street, which has granite curbs, as well as open areas that are either paved with asphalt or covered with gravel. The granite curbs along 20th Street would be retained as part of the 20th Street Historic Core Project, although new and/or extended streets within the project site would

be improved with curbs and gutters as required for all new development in San Francisco. The introduction of new streets, sidewalks, and plazas within the project site would retain a sense of the open, paved areas that exist around and between contributing historic buildings. Although the introduction of new and extended streets with improved curbs and gutters would somewhat reduce the integrity of setting of the UIW Historic District, these changes would not demolish or alter in an adverse manner those physical characteristics that justify the District's inclusion in the CRHR, and the District would retain sufficient integrity to continue to convey its historical significance.

For these reasons, the proposed network of streets, street trees, and open space would not result in a material impairment of the physical characteristics of the UIW Historic District that justify its inclusion in the California Register of Historical Resources, and therefore the impact would be less than significant.

Impact CR-11: The proposed infill construction would materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources. *(Less than Significant with Mitigation)*

The Secretary of the Interior's Rehabilitation Standard No. 9 states that "new work shall be differentiated from the old and shall be compatible with the massing, size, scale and architectural features to protect the integrity of the property and its environment." The proposed *Design for Development* contains standards and guidelines that are designed to address the required balance between differentiation and compatibility of new construction in the UIW Historic District. The *Design for Development* standards that primarily promote differentiation from historic buildings and visual variety include the following:

- *No Replication of Historic Buildings*. New construction shall not replicate or mimic historic buildings. False historicism is not permitted (S6.8.1).
- *Building Variety*. All new individual buildings within the Pier 70 SUD shall be visually distinct from each other with variations in: building massing, materials, glazing pattern and proportion, color, architectural detail, articulation, roofline modulation. Every building shall vary from its adjacent building in at least two of the above variations, of which one shall not be color (S6.8.2).
- *Façade Articulation*. Material selections shall reflect but not replicate the scale, pattern and rhythm of adjacent contributing buildings' exterior materials. Material selections shall not establish a false sense of historic development (S6.8.3).
- *Rooflines*. Duplication of the adjacent historic roofline is not permitted, unless flat (S6.10.2).

The proposed *Design for Development* also contains a number of standards and guidelines that promote compatibility and continuity with adjacent historic buildings, including the following:

- *Historic Rhythms and Patterns*. New construction buildings should incorporate, through contemporary interpretation, one or more of the following features drawn from Pier 70's historic character: horizontal banding, shifted patterns, articulated rooflines, repetitive patterns, gridded windows, and weathered materials (G6.8.1).
- *Material and Color Palette*. Material and color palette are encouraged to draw from Pier 70's historic texture and utilize the material palette provided (see Figure 4.D.12, p. 4.D.84). Materials that are intended to patina or weather are encouraged (G6.8.4).
- *Relate to Adjacent Resources*: In certain façade locations, new construction shall incorporate elements that relate to the adjacent resource in keeping with contemporary design and construction (S6.14.5).

The application of these *Design for Development* standards and guidelines, including the application of maximum heights, building articulation, material grain and palette, and building-specific responsiveness, would help maintain the integrity of the UIW Historic District by emphasizing the industrial character of the District. This would thereby reduce the impacts of new construction on the integrity of adjacent contributing buildings and the UIW Historic District.

For example, new infill construction adjacent to contributing Buildings 2, 6, 12, 21, 113, and 116 would be specifically designed to respond to the architectural character and qualities of these historic buildings through the use of setbacks, dimensional height referencing, and related treatment on select façades. New infill construction adjacent to the remnant of Irish Hill, also a contributor to the UIW Historic District, would be consistent with the dense, urban-industrial character-defining feature of the District, as well as the District's close groupings of buildings. Although the new construction would be clearly differentiated from the adjacent historic buildings through the use of modern construction materials and contemporary architectural design, the application of these building-specific treatments would also enhance their compatibility with the adjacent historic buildings, in keeping with the guidance provided in the *Design for Development* and the Secretary of the Interior's Standards, which call for a balance between the concepts of differentiation and compatibility.

The Proposed Project would also establish buffer zones surrounding the core of historic buildings and landscapes that specify the minimum distances of separation between historic buildings and landscapes and new construction. The buffer zones are intended to maximize visual and physical access to the District's historic buildings and to minimize visual intrusions into the integrity of contributing buildings. These separations would range in distance from 20 feet to 85 feet, and would typically span the width of existing and proposed new streets or pedestrian passageways The proposed buffer zones surrounding historic Buildings 2, 21, and 12 within the project site, together with the proposed buffer zones surrounding the historic buildings within the adjacent 20th Street Historic Core, are also intended to spatially unite these contributing buildings with each other as a historically and functionally related grouping of contributing buildings. The buffer

zones are also intended to prevent new infill construction from creating visual or physical barriers between the District's contributing buildings, reinforcing the historic visual and functional relationship between contributing features of the UIW Historic District. A buffer zone of 45 feet would be established between the peak of Irish Hill and adjacent new construction at Parcel PKS.

As new construction is expected to begin in 2018, would be phased over an approximately 11-year period, and could be designed and constructed by different development teams responding to varying real estate market conditions, it is possible that new infill development could change the historic significance of the UIW Historic District by introducing a wide variety of new building designs and types that may not be compatible with the historic character of adjacent historical resources. This could incrementally reduce the integrity of the UIW Historic District to the extent it may no longer qualify for the National Register, which would be considered a significant impact on historical resources. Implementation of Mitigation Measure M-CR-11: Performance Criteria and Review Process for New Construction, shown below, would ensure that future new construction would not alter, in an adverse manner, the physical characteristics of the UIW Historic District that justify its inclusion in the California Register of Historical Resources, and would thereby reduce this impact to a less-than-significant level.

Mitigation Measure M-CR-11: Performance Criteria and Review Process for New Construction

In addition to the standards and guidelines established as part of the Pier 70 SUD and *Design for Development*, new construction and site development within the Pier 70 SUD shall be compatible with the character of the UIW Historic District and shall maintain and support the District's character-defining features through the following performance criteria (terminology used has definition as provided in the *Design for Development*):

1. New construction shall comply with the Secretary of the Interior's Rehabilitation Standard No. 9: "New Addition, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale and architectural features to protect the integrity of the property and its environment."
2. New construction shall comply with the Infill Development Design Criteria in the Port of San Francisco's *Pier 70 Preferred Master Plan* (2010) as found in Chapter 8, pp. 57-69 (a policy document endorsed by the Port Commission to guide staff planning at Pier 70).
3. New construction shall be purpose-built structures of varying heights and massing located within close proximity to one another.
4. New construction shall not mimic historic features or architectural details of contributing buildings within the District. New construction may reference, but shall not replicate, historic architectural features or details.

5. New construction shall be contextually appropriate in terms of massing, size, scale, and architectural features, not only with the remaining historic buildings, but with one another.
6. New construction shall reinforce variety through the use of materials, architectural styles, rooflines, building heights, and window types and through a contemporary palette of materials as well as those found within the District.
7. Parcel development shall be limited to the new construction zones identified in *Design for Development* Figure 6.3.1: Allowable New Construction Zones.
8. The maximum height of new construction shall be consistent with the parcel heights identified in *Design for Development* Figure 6.4.1: Building Height Maximum.
9. The use of street trees and landscape materials shall be limited and used judiciously within the Pier 70 SUD. Greater use of trees and landscape materials shall be allowed in designated areas consistent with *Design for Development* Figure 4.7.1: Street Trees and Plantings Plan.
10. New construction shall be permitted adjacent to contributing buildings as identified in *Design for Development* Figure 6.3.2: New Construction Buffers.
11. No substantive exterior additions shall be permitted to contributing Buildings 2, 12, or 21. Building 12 did not historically have a south-facing façade; therefore, rehabilitation will by necessity construct a new south elevation wall. Building 21 shall be relocated approximately 75 feet east of its present placement, to maintain the general historic context of the resource in spatial relationship to other resources. Building 21's orientation shall be maintained.

Building Specific Standards

Each development parcel within the Pier 70 SUD has a different physical proximity and visual relationship to the contributing buildings within the UIW Historic District. For those façades immediately adjacent to or facing contributing buildings, building design shall be responsive to identified character-defining features in the manner described in the *Design for Development* Buildings chapter. All other façades shall have greater freedom in the expression of scale, color, use of material, and overall appearance, and shall be permitted if consistent with Secretary Standard No. 9[49] and the *Design for Development*.

Table M.CR.1: Building-Specific Responsiveness, indicates resources that are located adjacent to, and have the greatest influence on the design of, the noted development parcel façade.

[49] Standard No. 9 states that "New Addition, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale and architectural features to protect the integrity of the property and its environment."

Table M.CR.1: Building-Specific Responsiveness

Façade/Parcel Name-Number	Contributing Building (Building No.)
North and West; A	113
North and Northeast; B	113, 6
North; C1	116
East and South; C2	12
South and West; D	2, 12
East and South; E1	21
West; E2	12
West; E4	21
North; F/G	12
East; PKN	113-116

Source: ESA 2015.

Palette of Materials

In addition to the standards and guidelines pertaining to application of materials in the *Design for Development*, the following material performance standards would apply to the building design on the development parcels (terminology used has definition as provided in the *Design for Development*):

- Masonry panels that replicate traditional nineteenth or twentieth century brick masonry patterns shall not be allowed on the east façade of Parcel PKN, north and west façades of Parcel A or on the north façade of Parcel C1.
- Smooth, flat, minimally detailed glass curtain walls shall not be allowed on the façades listed above. Glass with expressed articulation and visual depth or that expresses underlying structure is an allowable material throughout the entirety of the Pier 70 SUD.
- Coarse-sand finished stucco shall not be allowed as a primary material within the entirety of the UIW Historic District.
- Bamboo wood siding shall not be allowed on façades listed above or as a primary façade material.
- Laminated timber panels shall not be allowed on façades listed above.
- When considering material selection immediately adjacent to contributing building (e.g., 20th Street Historic Core; Buildings 2, 12, and 21; and Buildings 103, 106, 107, and 108 located within or immediately adjacent to the BAE Systems site), characteristics of compatibility and differentiation shall both be taken into account. Material selection shall not duplicate adjacent building primary materials and treatments, nor shall they establish a false sense of historic development.
- Avoid conflict of new materials that appear similar or attempt to replicate historic materials. For example, Building 12 has character-defining corrugated steel cladding. As such, the eastern façade of Parcel C2, the northern façade of Parcels F and G, and the southern façade of Parcel D1 shall not use corrugated steel cladding as a primary material. As another example, Building 113 has character-defining brick-masonry

construction. As such, the northern and western façades of Parcel A and the eastern façade of Parcel K North shall not use brick masonry as a primary material.

- Use of contemporary materials shall reflect the scale and proportions of historic materials used within the UIW Historic District.
- Modern materials shall be designed and detailed in a manner to reflect but not replicate the scale, pattern, and rhythm of adjacent contributing buildings' exterior materials.

Review Process

Prior to Port issuance of building permits associated with new construction, San Francisco Planning Department Preservation staff, in consultation with the San Francisco Port Preservation staff, shall use the Final Pier 70 SUD *Design for Development* Standards, including Secretary Standard No. 9, to evaluate all future development proposals within the project site for proposed new construction within the UIW Historic District. As part of this effort, project sponsors shall also submit a written memorandum for review and approval to San Francisco Planning Department Preservation staff that confirms compliance of all proposed new construction with these guiding plans and policies.

Impact CR-12: The Proposed Project would not materially alter, in an adverse manner, the physical characteristics of other historical resources (outside of the UIW National Register Historic District) that justify inclusion of such resources in a Federal, State or local register of historical resources. *(Less than Significant)*

As discussed under "Historic Resources Outside of UIW District" on pp. 4.D.62-4.D.64, other historical resources (not within the UIW National Register Historic District) are located adjacent to the project site. The former American Can Company Building (the American Industrial Center) at 2301 Third Street, and the Central Waterfront Historic District (which includes the American Can Company Building) are located across Illinois Street west of the project site. The PG&E Station Potrero Power Plant (the PG&E Potrero Substation) at 1201 Illinois Street is located immediately south of the project site, and the historic Kneass Boatworks Building at 671 Illinois Street is located north of the project site.

Although the Proposed Project would have no direct physical impact on these historic architectural resources, the Proposed Project could have an indirect visual impact on these resources by altering their immediate visual setting. However, the integrity and historic significance of adjacent historic architectural resources is not premised on their possessing an intact and cohesive visual relationship with their surroundings. The Proposed Project would not destroy historic features and materials that characterize nearby historic architectural resources. New construction within the project site would be contemporary in design and materials and would not convey a false sense of historic development. The character-defining features and form

of nearby historic architectural resources would continue to be clearly evident from surrounding streets.

For these reasons, the indirect visual impacts of the Proposed Project are not those of a project that "demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by the lead agency for purposes of CEQA." (CEQA Guidelines Section 15064.5(b)(2)(C)). No mitigation measures are necessary.

Cumulative Impacts

Impact C-CR-2: The impacts of the Proposed Project, in consideration of other past, present, and future projects, would materially alter, in an adverse manner, the physical characteristics of the UIW National Register Historic District that justify its inclusion in the California Register of Historical Resources, and would materially alter the physical characteristics of Building 21 that justify its individual eligibility for inclusion in the California Register of Historical Resources. *(Less than Significant with Mitigation)*

The analysis of cumulative impacts to historic architectural resources addresses all past, present, and reasonably foreseeable future projects within the boundaries of the UIW Historic District, which, in addition to the impacts of the Proposed Project, may have a significant, adverse cumulative impact to the significance of the UIW Historic District. In addition to the Proposed Project, there are three anticipated projects within the UIW Historic District that have the potential to have a significant cumulative impact on the significance of the UIW Historic District: (1) Crane Cove Park project, (2) BAE Systems Lease Renewal project, and (3) revisions to the on-going 20th Street Historic Core project, which would demolish historic Buildings 40 and 117. These projects and their potential impacts to historic architectural resources are described below, followed by an evaluation of the Proposed Project's contribution to these impacts.

Crane Cove Park Project

The Crane Cove Park project is an approximately 11-acre area located at Pier 70, bounded by Illinois Street to the west, San Francisco Bay to the east, Mariposa Street to the north, and 19th Street to the south. The project site is approximately one block north of the Pier 70 SUD project site. The site includes five historic buildings (Buildings 30, 49, 50, 109, 110), Slipways 1 through 4, and Cranes 30 and 14, and the historic iron fencing along Illinois Street all of which contribute to the UIW Historic District, a historical resource under CEQA. The Crane Cove Park project would involve the following actions: (1) construction of a new, approximately 9.8-acre shoreline park (Crane Cove Park); (2) extension of 19th Street for park access and circulation; (3) creation of Georgia Street, which would connect 20th Street to the 19th Street extension; (4)

relocation of the BAE shipyard entrance from 20th Street to the terminus of the 19th Street extension and rerouting of BAE shipyard truck traffic from 20th Street to the 19th Street extension; and (5) street improvements along the eastern side of Illinois Street. The project would involve the renovation of Buildings 49, 109, and 110, whereas Buildings 30 and 50 would be demolished. Slipway 4 would be rehabilitated as a plaza, and Crane 14 would be relocated to the end of Slipway 4. Crane 30 would remain in its current location. Slipways 1-3, a contributing feature within the District, would remain in their present condition, with some removal of fill material to expose the features to tidal action. The iron fence along Illinois Street would be retained in place.[50]

The Planning Department completed the environmental review for the Crane Cove Park project in October 2015. As part of the Crane Cove Park environmental review, Planning Department Preservation staff completed a HRER that evaluated the impacts of the project on historical resources.[51] Department staff found that the demolition of two contributing buildings (Buildings 30 and 50) within the UIW Historic District would not cause a significant adverse impact upon any qualified historical resource. The District would retain a high number of contributing features, and many of the demolished buildings are ancillary and/or repetitive relative to the District's history and significance. The department also found that the rehabilitation of the contributing features, including Buildings 49, 109, and 110; Slip No. 4; and Cranes 14 and 30, would meet the Secretary of the Interior's Standards for Rehabilitation. Further, the new construction anticipated for the project site would have a less-than-significant impact upon the District, because the new construction would be appropriately designed to preserve the District's character-defining features, while also accommodating for new design features.

BAE Systems Lease Renewal Project

The BAE shipyard is an approximately 15-acre area at Pier 70 located at the foot of 20th Street. The shipyard is currently used as a ship repair facility operating under a lease with the Port of San Francisco by BAE Systems. The project site includes piers, drydocks, and 19 buildings that support the maintenance, alteration, and repair of ships. The BAE shipyard is located within the UIW Historic District, to the north and west of the Pier 70 SUD project site. The Port executed a new lease with BAE Systems in 2015 to continue the existing ship repair use without any expansion or intensification of use. The lease includes the following specific tenant obligations within or at the perimeter of the project site: (1) demolition of three contributors (Buildings 38, 119, 121) of the 19 existing buildings to provide for additional laydown space for ship repair; (2)

[50] San Francisco Planning Department, *Certificate of Determination, Exemption from Environmental Review, Crane Cove Park,* Case No. 2015.001314ENV, October 5, 2015.
[51] San Francisco Planning Department, Historic Resource Evaluation Response (HRER), Pier 70 Crane Cove Park, September 15, 2015.

removal of 12 polychlorinated biphenyl electric transformers (PCB); (3) removal of non-historic Cranes 2 and 6; and (4) perimeter landscaping improvements. Buildings 38, 119, and 121 are contributors to the UIW Historic District, a historical resource under CEQA.[52]

The Planning Department completed the environmental review for the BAE Systems Lease Renewal Project in March 2015. As part of the BAE Systems Lease Renewal Project environmental review, Planning Department Preservation staff completed a HRER that evaluated the impacts of project on historical resources.[53] Department staff found that the demolition of Buildings 38, 119, and 121 would not impact the integrity of the UIW Historic District due to the diminished integrity of the three buildings, the size of the District, and the number of other contributing features that are similar in architectural character, history, and date of construction. Building 38, built in 1915, was one of several buildings constructed to support the shipbuilding activities during World War I. Despite its demolition, the District would retain other examples of support structures and World War I-era buildings, such as Buildings 108, 109, and 111 near the shoreline and Pier 68 high water platform, which would allow the District to continue to convey this early era of development and maritime activity. Buildings 119 and 121 are ancillary World War II-era buildings, which were constructed to support the site's shipbuilding activities. Although Building 119 would be demolished, this resource type would continue to be represented within the District by Building 110, which is very similar in size, plan, architectural treatment, and use of materials. Also, despite the demolition of Building 121, other contributing buildings such as Buildings 110, 122, and 123 would provide examples of small-scale facilities development in the shipyard during World War II. Overall, other properties within the UIW Historic District would assist in conveying the significance of these contributors. Therefore, the HRER concluded that the demolition of these three buildings would not materially impair the designation of the UIW Historic District on the NRHP. For the reasons, Planning Department staff found the BAE Systems Lease Renewal project would result in less-than-significant impacts on historical resources.

Demolition of Historic Buildings 40 and 117 as Part of Revisions to the 20th Street Historic Core Project

In 2014, the San Francisco Planning Department issued a CPE for the 20th Street Historic Core Project (Case No. 2013.1168E) to the Port of San Francisco for the rehabilitation of 10 historic buildings at Pier 70. These buildings are contributors that form the core of the UIW Historic District. The rehabilitation project is currently underway. As discussed in Section 4.A,

[52] San Francisco Planning Department, *Certificate of Determination, Exemption from Environmental Review, SF Port – Pier 70 Area – BAE Lease Renewal*, Case No. 2014.0713, March 2, 2015.

[53] San Francisco Planning Department, Historic Resource Evaluation Response (HRER), Pier 70 BAE Ship Repair, February 20, 2015.

Introduction to Chapter 4, pp. 4.A.14, in 2015 the Port added demolition of contributing Buildings 40 and 117, located within the Pier 70 project site. Buildings 40 and 117 are proposed for demolition because they are located in the alignment of the proposed sidewalk along the frontage of the future Crane Cove Park and the extension of 21st Street eastward to provide vehicular and pedestrian access into the Pier 70 site. The following is a summary from information submitted by the Port of San Francisco in connection with environmental review of the proposed demolition of Buildings 40 and 117. [54]

Building 40

Building 40 is a three story, 8,359-square-foot wood frame building that was constructed in 1941 and served as the Shipyard Employment Office Annex. Building 40 is a contributor to the District as a support building that represents the increase in facilities to accommodate the peak labor force during WWII. Although it is a contributor to the District, it has experienced significant deterioration that affects its integrity. The roof of the northern portion of the building has failed and is open to the sky, resulting in water damage that has caused the interior of the building to collapse. Removal of Building 40 as part of the 20th Street Historic Core Building 40 and 117 project would allow the Port to construct a standard width sidewalk along the frontage of the future Crane Cove Park (currently the sidewalk extends just a few hundred feet north of the corner of 20th and Illinois streets) on the east side of Illinois Street between 20th and 18th streets behind (east of) the historic iron fencing, also a contributing feature within the Historic District. Removal of Building 40 would not affect the adjacent historic iron fencing or other contributing buildings and features or the historic significance of the District because it contains other, more significant examples of WWII expansion of the shipyard, including Buildings 2, 6, 12, 14 and 49.[55]

Although Building 40 is a contributor to the District, it was not found to possess individual significance because it is one of many architecturally undistinguished support buildings from World War II and it has lost integrity due to advanced deterioration. Therefore, it would not qualify for listing under the National or California Registers as an individual historical resource.[56]

Building 117

Building 117 is a one story, 31,440-square-foot steel frame warehouse constructed in 1937/41, and is a contributor to the UIW Historic District. Building 117 is attached to the south elevation

[54] Port of San Francisco, *EE Application/Continuation Sheet for 20th Street Historic Building Rehabilitation Project*, Case No. 2013.1168E, December 4, 2015.
[55] Ibid.
[56] Port of San Francisco, *Union Iron Works Historic District Profiles of Contributing and Non-Contributing Resources Proposed for Demolition by Project Area, May 16, 2016.*

of historic Building 116. Building 117 is proposed for demolition as part of the 20th Street Historic Core Building 40 and 117 project because it is located in the alignment of the proposed extension of 21st Street eastward to provide vehicular and pedestrian access into the Pier 70 site. The extension of the street would serve existing activities and future development in the central portion of the site, becoming an extension of the city street network. The loss of Building 117 would impact the integrity of the Historic District, but it would not lose its historic significance because other examples of WWII-era steel frame corrugated metal warehouse buildings would remain throughout the District, including Buildings 6, 12, 14, 49.[57]

Although Building 117 is a contributor to the District, it was not found to possess individual significance because its simple, undistinguished, and utilitarian design lacks architectural distinction, and it had a minor support function as a parts storage warehouse in the shipbuilding and repair process. Therefore, it would not qualify for listing under the National or California Registers as an individual historical resource.[58]

For these reasons, the Planning Department and the Port of San Francisco found that the proposed demolition of Buildings 40 and 117 would have a less-than-significant impact on the integrity of the UIW Historic District. Moreover, neither building is individually eligible for the NRHP or CRHR for the reasons stated above. Therefore, their demolition would not result in a substantial adverse change to historical resources as defined by CEQA.

Evaluation of Cumulative Impacts

The Planning Department concurs that that despite the new construction under the Crane Cove Park project and the loss of two contributing buildings (Buildings 30 and 50), the loss of three contributing buildings (Buildings 38, 119, and 121) from the BAE Systems Lease Renewal project, and the loss of two contributing buildings (Buildings 40 and 117) from the revised 20th Street Historic Core project, these three projects would have a less-than-significant impact on the integrity of the UIW Historic District. As described above, the Proposed Project would result in a less-than-significant impact to historical resources (demolition of seven contributing resources), and would result in significant but mitigable impacts to historical resources resulting from rehabilitation of three contributing features and new infill construction, (with implementation of Mitigation Measures M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria, and M-CR-11: Performance Criteria and Review Process for New Construction.) Accordingly, with mitigation, all Project impacts to historical resources would be less than significant.

[57] Ibid.
[58] Ibid.

In summary, all of these projects cumulatively would result in the collective loss of 14 historic buildings that contribute to the significance of the UIW Historic District, as well as the retention and rehabilitation, or no change, to the other 30 contributing features. Table 4.D.5: Cumulative Effects to All Contributing Resources in the UIW Historic District, provides a list of the effects to all contributing features resulting from past, present, and reasonably foreseeable projects within the UIW Historic District. The collective demolition of these buildings and its cumulative impact on the integrity of the UIW Historic District were analyzed in a report prepared by Carey & Co., Inc. for the Port of San Francisco in August 2015.[59] The Planning Department reviewed and concurred with the report findings, which were restated within in the BAE Ship Repair HRER. The results of this analysis include the following:

- The demolitions would enhance the ongoing ship repair activity by allowing for additional space related to ship repair activities. The authenticity of maritime use within a portion of the Historic District would allow the public to experience large-scale heavy industrial ship repair activity, the only such maritime use on San Francisco Bay.
- A significant concentration of World War II-era contributing features and buildings would remain in the Historic District. They would continue to provide strong visual and physical examples of the World War II era of the Historic District. In many instances, the structures to be demolished are repeated elsewhere in the Historic District, as is the case with World War II warehouses, restrooms, and electrical power substations.
- The proposed demolitions would allow the existing ship repair facility to continue into the future by allowing for expanded open staging areas for ship repair and would provide opportunities for new compatible infill development that would help support the adaptive use of the remaining contributors to the UIW Historic District.
- The proposed loss of these contributors would not result in the need to adjust the boundary because it represents the historic ownership and maximum development of the District at its peak operation during World War II. The boundary for the District, as with most historic districts, includes areas with non-contributing features.

[59] Carey & Co., Inc., *Analysis of Proposed Demolitions within the Union Iron Works Historic District at Pier 70,* prepared for the Port of San Francisco, Case No: 201.001272ENV, August 2015.

Table 4.D.5: Cumulative Effects to Contributing Features in the UIW Historic District

Building Number (Name)	Demolish (Project)	Retain/Rehab (Project)
Building 2 (Warehouse No. 2)		(Proposed Project)
Building 6 (Light Warehouse No. 6)		No Change
Building 11 (Tool Room and Navy Office)	(Proposed Project)	
Building 12 (Plate Shop No. 2)		(Proposed Project)
Building 14 (Heavy Warehouse)		(20th Street Historic Core)
Building 15 (Layout Yard)	(Proposed Project)	
Building 16 (Stress Relieving Building)	(Proposed Project)	
Building 19 (Garage No. 1)	(Proposed Project)	
Building 21 (Substation No. 5)		(Proposed Project)
Building 25 (Washroom/Locker Room)	(Proposed Project)	
Building 30 (Template Warehouse)	(Crane Cove)	
Building 32 (Template Waterhouse)	(Proposed Project)	
Building 36 (Welding Shop)		No Change
Building 38 (Pipe and Electric Shop)	(BAE Systems)	
Building 40 (Employment Office Annex)	(20th Street Historic Core)	
Building 49 (Galvanizing Warehouse)		(BAE Systems)
Building 50 (Pier 68 Substation No.2)	(Crane Cove)	
Building 66 (Welding Shed)	(Proposed Project)	
Building 101 (Bethlehem Steel Administration Building)		(20th Street Historic Core)
Building 102 (Powerhouse)		No Change
Building 103 (Steam Powerhouse No. 2)		(20th Street Historic Core)
Building 104 (UIW Office Building)		(20th Street Historic Core)
Building 105 (Forge Shop)		(20th Street Historic Core)
Building 107 (Lumber Storage)		No Change
Building 108 (Planning Mill and Joinery Shop)		No Change
Building 109 (Plate Shop No. 1)		(BAE Systems)
Building 110 (Yard Washroom/Locker Room)		(BAE Systems)
Building 111 (Main Office and Substation No. 3)		No Change
Building 113 (UIW Machine Shop)		(20th Street Historic Core)

Table 4.D.5 Continued

Building Number (Name)	Demolish (Project)	Retain/Rehab (Project)
Building 114 (Blacksmith Shop)		(20th Street Historic Core)
Building 115 (Concrete Warehouse)		(20th Street Historic Core)
Building 116 (Concrete Warehouse)		(20th Street)
Building 117 (Warehouse No. 9/Shipyard Training Center)	(20th Street Historic Core)	
Building 119 (Yard Washroom)	(BAE Systems)	
Building 120 (Pipe Rack/Women's Washroom)		No Change
Building 121 (Drydock Office)	(BAE Systems)	
Building 122 (Check House No. 1)		(20th Street Historic Core)
Building 123 (Check House No. 2)		(20th Street Historic Core)
Slipways 1-3 (site of Slipways 1, 2, and 3)		(BAE Systems)
Slip 4, and Cranes 14 and 30		(BAE Systems)
Whirley Crane 27		No Change
Pier 68 (Highwater Platform)		No Change
Iron Fence (at 20th and Illinois streets)		(BAE Systems)
Irish Hill (remnant)		(Proposed Project)
Total Demolish	**14**	
Total Retain/Rehab/No Change		**30**

Overall, the Planning Department found that the proposed demolitions resulting from the Crane Cove Park project, BAE Systems Lease Renewal project, and changes to the 20th Street Historic Core project, in addition to those of the Proposed Project, would not materially impair the integrity of the UIW Historic District or its listing on the NRHP. The Planning Department also found that rehabilitation and infill construction associated with the Proposed Project would not materially impair the integrity of the UIW Historic District with implementation of the aforementioned mitigation measures. Therefore, the Proposed Project and the other projects described above would, with implementation of Mitigation Measures M-CR-5 and M-CR-11 identified herein, collectively result in a less-than-significant cumulative impact upon historical resources.

Impact C-CR-3: The impacts of the Proposed Project, in consideration of other past, present, and future projects, would not materially alter, in an adverse manner, the physical characteristics of historical resources (outside of the UIW National Register Historic District) that justify its inclusion in the California Register of Historical Resources, resulting in a cumulative impact. *(Less than Significant)*

As discussed above under Impact CR-12, other historical resources (not within the UIW National Register Historic District) are located in the vicinity of the project site (including the former American Can Company Building, the Central Waterfront Historic District, the PG&E Station Potrero Power Plant, and the historic Kneass Boatworks Building.

The Proposed Project would not contribute to direct physical impacts on historic architectural resources. To the extent it could contribute some indirect visual impact, considered together with reasonably feasible projects in the vicinity by altering their immediate visual setting, the integrity and historic significance of adjacent historic architectural resources is not premised on their possessing an intact and cohesive visual relationship with their surroundings. The Proposed Project, together with reasonably feasible projects in the vicinity, would not destroy historic features and materials that characterize nearby historic architectural resources. The character-defining features and form of nearby historic architectural resources would continue to be clearly evident from surrounding streets.

The physical impacts of the Proposed Project on the significance of the UIW Historic District resource would not combine with that of other projects to make a considerable contribution to a significant cumulative impact on the integrity of other architectural resources in the vicinity, or more broadly in the City, State or nation. The Proposed Project, considered together with reasonably feasible projects, would not contribute to the demolition or material alteration of a historical resource outside of the UIW Historic District. No mitigation measures are necessary.

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E. TRANSPORTATION AND CIRCULATION

Section 4.E, Transportation and Circulation, addresses the impacts that transportation and land use changes related to the Pier 70 Mixed-Use District Project would have on traffic, transit, pedestrian and bicycle travel and circulation, loading, and emergency access. The section describes existing transportation conditions on the project site and in the transportation study area, and presents the baseline transportation conditions against which project impacts are measured. Project-specific impacts are presented for both the maximum residential scenario and the maximum commercial scenario, and mitigation measures to reduce identified impacts and/or improvement measures to make improvements to portions of the Proposed Project where there would not be significant impacts are identified. The Proposed Project's contribution to significant cumulative impacts is identified for each transportation mode. While parking is no longer considered in determining if the Proposed Project has the potential to result in significant environmental impacts, the section presents the Proposed Project's parking demand in relation to the proposed parking supply for informational purposes only. The section summarizes the information provided in the *Pier 70 Mixed-Use District Project Transportation Impact Study* (TIS).[1] The analyses use methods consistent with the 2002 *San Francisco Transportation Impact Analysis Guidelines for Environmental Review* (hereinafter referred to as the *SF Guidelines*).

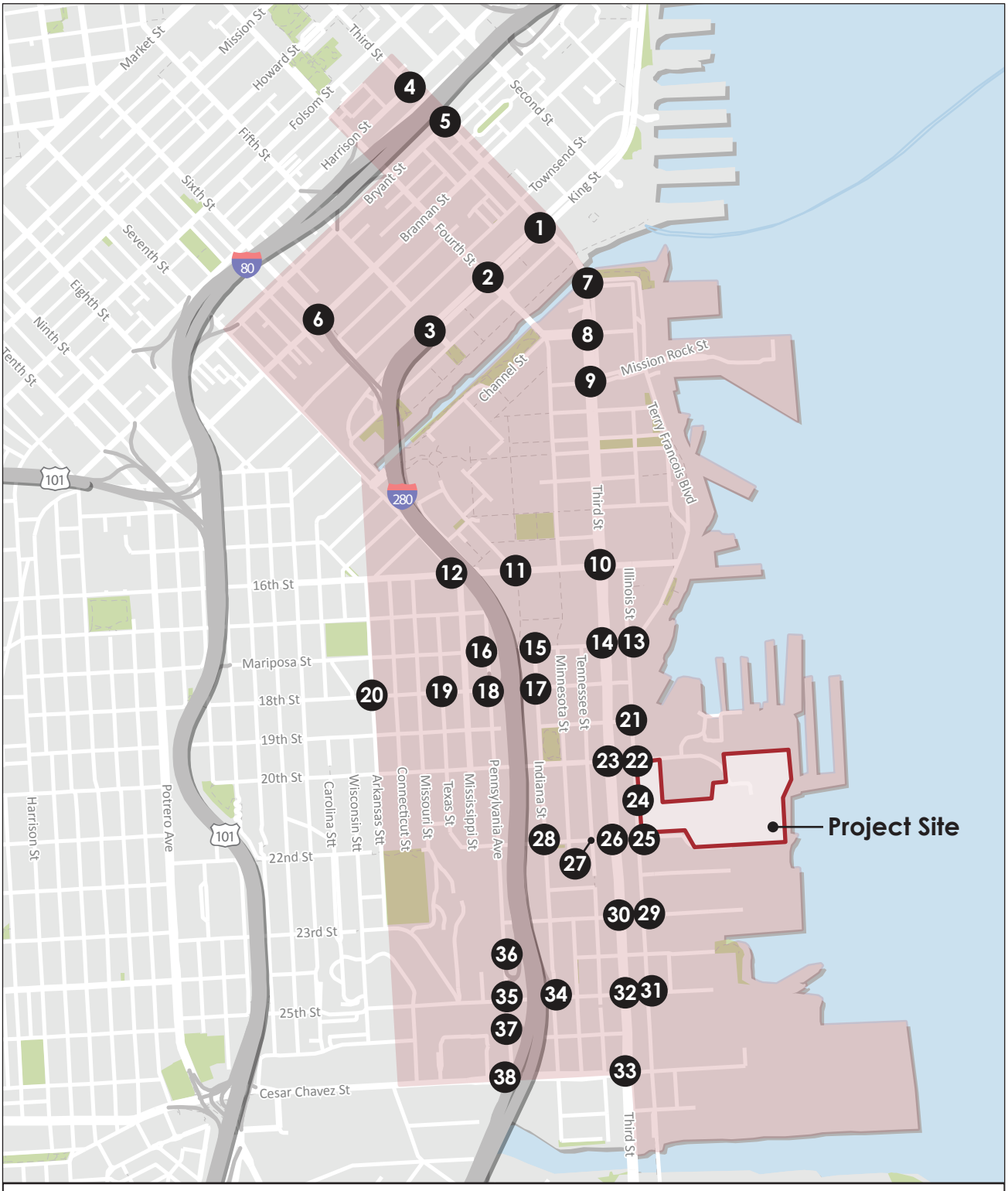
ENVIRONMENTAL SETTING

TRANSPORTATION STUDY AREA

The transportation study area is bounded roughly by San Francisco Bay, Third Street (north of Mariposa Street), Harrison Street, Fourth Street, Bryant Street, Seventh Street, Arkansas Street, Cesar Chavez Street, and Illinois Street, as shown on Figure 4.E.1: Transportation Study Area and Study Intersections. The transportation study area includes all aspects of the transportation network that may be measurably affected by trips generated by the Proposed Project. The study area is defined by travel corridors and by facilities such as transit routes and stations, bicycle routes and amenities, pedestrian sidewalks and crossings, and the overall vehicular roadway network that residents and visitors would use in traveling to and from the project site.

A total of 37 existing intersections (38 with the Proposed Project) within the transportation study area were identified as key locations that are likely to be affected by the Proposed Project, and were selected for detailed study, particularly for pedestrian conditions. These study intersections include all major intersections along Third Street, Illinois Street, 25th Street, Mariposa Street, and 16th Street, as well as numerous local intersections along access routes to and from U.S. Highway

[1] Fehr & Peers, *Pier 70 Mixed-Use District Project Transportation Impact Study*, December 2016.



Source: Fehr and Peers (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.E.1: TRANSPORTATION STUDY AREA AND STUDY INTERSECTIONS

101 (U.S. 101) and Interstate-280 (I-280) within the study area. Intersections farther away were not analyzed as part of the study, because project-generated travel remaining on local streets would be dispersed, and, consequently, the Proposed Project's effects would be relatively small.

The study intersections are identified by number on Figure 4.E.1; the intersections corresponding to numbers on Figure 4.E.1 are listed in Table 4.E.1: Study Intersections.

Table 4.E.1: Study Intersections

Intersection	Traffic Control
1. King Street / Third Street	Signal
2. King Street / Fourth Street	Signal
3. King Street / Fifth Street / I-280 ramps	Signal
4. Third Street / Harrison Street	Signal
5. Third Street / Bryant Street	Signal
6. Sixth Street / Brannan Street / I-280 ramps	Signal
7. Third Street / Terry A Francois Boulevard	Signal
8. Third Street / Channel Street	Signal
9. Third Street / Mission Rock Street	Signal
10. 16th Street / Third Street	Signal
11. 16th Street / Owens Street	Signal
12. 16th Street / Seventh Street / Mississippi Street	Signal
13. Mariposa Street / Terry A Francois Boulevard / Illinois Street	All Way Stop Control
14. Mariposa Street / Third Street	Signal
15. Mariposa Street / I-280 NB off-ramp	Signal
16. Mariposa Street / I-280 SB on-ramp	Secondary Street Stop Control
17. 18th Street / I-280 NB on-ramp	Secondary Street Stop Control
18. 18th Street / I-280 SB off-ramp	Secondary Street Stop Control
19. 18th Street / Texas Street	Secondary Street Stop Control
20. 18th Street / Arkansas Street	All Way Stop Control
21. 19th Street / Illinois Street	Secondary Street Stop Control
22. 20th Street / Illinois Street	All Way Stop Control
23. 20th Street / Third Street	Signal
24. 21st Street / Illinois Street (future)	-
25. 22nd Street / Illinois Street	All Way Stop Control

Table 4.E.1 Continued

Intersection	Traffic Control
26. 22nd Street / Third Street	Signal
27. 22nd Street / Tennessee Street	Secondary Street Stop Control
28. 22nd Street / Indiana Street	All Way Stop Control
29. 23rd Street / Illinois Street	Secondary Street Stop Control
30. 23rd Street / Third Street	Signal
31. 25th Street / Illinois Street	Signal
32. 25th Street / Third Street	Signal
33. Cesar Chavez Street / Third Street	Signal
34. 25th Street / Indiana Street / I-280 NB on-ramp	All Way Stop Control
35. 25th Street / Pennsylvania Street	All Way Stop Control
36. Pennsylvania Street / I-280 SB off-ramp	All Way Stop Control
37. Pennsylvania Street / I-280 SB on-ramp	Secondary Street Stop Control
38. Cesar Chavez Street / Pennsylvania Street / I-280 NB Off	Signal

Source: Fehr & Peers, 2015

EXISTING CONDITIONS

Roadway Facilities

The study area is served by three freeways providing regional access and multiple local streets providing access to the project site. A section describing local roadways is followed by a description of the freeways serving the study area.

Local Roadways

Local access to the project site and the transportation study area is provided by an urban street grid network. Third Street is the main north-south street in the study area and is one of the major arterials in this eastern part of San Francisco. Mariposa and 16th streets are main east-west streets in the study area; Cesar Chavez Street is a main east-west arterial at the south end of the study area. Access to the project site is from 20th Street/Illinois Street and 22nd Street/Illinois Street, one block east of Third Street. Most of the local roadways in the study area are described in Table 4.E.2: Local Roadway Network. The table identifies the following for each of the key streets in the study area: street name; direction (east-west or north-south); typical number of lanes; the streets' designations in the *San Francisco General Plan*, if any; transit routes that use a street; and any bicycle facilities.

Table 4.E.2: Local Roadway Network

Street Name	Direction	Lanes (typical)	General Plan Designation[1]	Transit Routes[1]	Bicycle Facilities / Routes (typical) [1,2]
Third Street	N-S	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Primary Transit Important Preferential Street Citywide Pedestrian Network Street Neighborhood Commercial Pedestrian Street Near-Term Bicycle Improvement Projects & Minor Improvements to Bicycle Route Network	8X, 8AX, 8BX, 9, 30, 45, 55, 81X, T	Class III[3]
Fourth Street	N-S	2/4[4]	Congestion Management Network Major Arterial Metropolitan Transportation System Street Primary Transit Important Preferential Street Citywide Pedestrian Network Street Neighborhood Commercial Pedestrian Street & Minor Improvements to Bicycle Route Network	47	Class II
Fifth Street	N-S	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Near-Term Bicycle Improvement Projects	8X, 8AX, 8BX, 27, 30, 45, 47	Class III, Route 19
Sixth Street	N-S	4-6[5]	Congestion Management Network Major Arterial Metropolitan Transportation System Street Neighborhood Commercial Pedestrian Street	14X, 27	-
Seventh Street	N-S	2-4[6]	Congestion Management Network Major Arterial Metropolitan Transportation System Street	19	Class II, Route 23
16th Street	E-W	4	Primary Transit Oriented Preferential Street Neighborhood Commercial Pedestrian Street Near-Term Bicycle Improvement Projects	22, 33, 55	Class II, Route 40
18th Street	E-W	2[7]	Neighborhood Commercial Pedestrian Street (section)	22	-
19th Street	E-W	2	-	-	-

Table 4.E.2 Continued

Street Name	Direction	Lanes (typical)	General Plan Designation[1]	Transit Routes[1]	Bicycle Facilities / Routes (typical) [1,2]
20th Street	E-W	2	Neighborhood Commercial Pedestrian Street (section)	22, 48	-
21st Street (future only)	E-W	2	-	-	-
22nd Street	E-W	2	-	48	-
23rd Street	E-W	2	-	10, 19, 48	-
25th Street	E-W	2	-	10, 48	-
Arkansas Street	N-S	2	-	10	-
Brannan Street	E-W	2/4[8]	-	82X, 83X	-
Bryant Street	E-W	2-5[9]	Primary Transit Important/Secondary Transit Preferential Street Neighborhood Commercial Pedestrian Street	8, 8AX, 8BX, 27, 47	-
Cesar Chavez Street	E-W	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Near-Term Bicycle Improvement Projects	-	Class II, Route 60
Channel Street	E-W	2/4[10]	-	-	-
Harrison Street	E-W	4-5	Congestion Management Network Major Arterial Primary Transit Important/Secondary Transit Preferential Street Neighborhood Commercial Pedestrian Street	12, 27, 47	-
Illinois Street	N-S	2	-	48	Class II, Route 5
Indiana Street	N-S	2	Minor Improvements to Bicycle Route Network	-	Class III, Route 7
King Street	E-W	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Primary Transit Important Preferential Street Neighborhood Pedestrian Network Connection Street	N, T	Class II/Class III, Route 5
Mariposa Street	E-W	2/4[11]	-	-	Class III, Route 7/23
Mission Rock Street	E-W	2[12]	-	-	-

Table 4.E.2 Continued

Street Name	Direction	Lanes (typical)	General Plan Designation[1]	Transit Routes[1]	Bicycle Facilities / Routes (typical) [1,2]
Mississippi Street	N-S	2	-	-	Class II [13]
Owens Street	N-S	4	-	-	-
Pennsylvania Street	N-S	2	-	48	-
Tennessee Street	N-S	2	-	22	-
Terry A Francois Boulevard	N-S	4	-	-	Class II, Route 5
Texas Street	N-S	2	-	-	-

Notes:

E-W = east-west. N-S = north-south.

[1] The descriptions associated with each street (General Plan Designation, Transit Routes, etc.) are those that apply to some portion of that street, although not necessarily the entire length of that street.

[2] Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles. Class III bikeways are signed bike routes that allow bicycles to share the travel lane with vehicles. See Section 2.7 for additional discussion.

[3] Except between China Basin Street and Cesar Chavez Street where there are no bicycle facilities.

[4] Two lanes from 16th Street to Channel Street; four lanes north of Channel Street, except six lanes from King Street to Townsend Street.

[5] Four lanes from Market Street to Howard Street; five lanes (three northbound, two southbound) from Howard Street to Folsom Street during peak periods only (four lanes during other times); six lanes during peak periods only from Folsom Street to Brannan Street (four lanes during other times).

[6] Two lanes from 16th Street to King Street; three lanes from King Street to Brannan Street; four lanes north of Brannan Street.

[7] Two lanes except between Minnesota Street and Pennsylvania Avenue where there are three lanes and an additional westbound right-turn lane onto the I-280 freeway.

[8] Two lanes from The Embarcadero to Colin P Kelly Jr Street; four lanes southwest of Colin P Kelly Jr Street.

[9] Five lanes from Seventh Street to Second Street; three lanes from Second Street to I-80 ramp; two lanes from I-80 ramp to Beale Street; three lanes from Beale Street to The Embarcadero.

[10] Four lanes from Third Street to Fourth Street; two lanes elsewhere.

[11] Four lanes from Terry A Francois Boulevard to Pennsylvania Avenue; two lanes elsewhere.

[12] Six lanes at intersection with Terry A Francois Boulevard.

[13] Class II bicycle facility from 16th Street to Mariposa Street; no bicycle facilities elsewhere.

Source: Fehr & Peers, 2015; *San Francisco General Plan*

Regional Roadways

Interstate 80 (I-80) provides the primary regional access to the project site from the East Bay. I-80 runs through the northern portion of the study area and connects San Francisco to the East Bay and other points east via the San Francisco–Oakland Bay Bridge. I-80 eastbound can be accessed via the on-ramp at Fifth Street / Bryant Street, and the project site can be accessed from westbound I-80 at the off-ramp at Fifth Street / Harrison Street. Within the study area, I-80 has six lanes (three in each direction).

I-280 provides regional access to the study area from the South Bay and Peninsula. I-280 and U.S. 101 have an interchange to the south of the study area, and I-280 terminates in the study area at the King and Fifth streets intersection. I-280 is generally a six-lane freeway. The project site can be accessed from either the Mariposa Street or the Cesar Chavez Street off-ramps in the northbound direction or the 18th Street or Pennsylvania / 25th Street off-ramps in the southbound direction. The nearest on-ramps are from 25th Street or 18th Street in the northbound direction and Mariposa Street and Pennsylvania / 25th Street in the southbound direction.

U.S. 101 provides access to the north and south of the study area. U.S. 101 is to the west of the study area and provides access to the Peninsula and South Bay. U.S. 101 connects with I-80 and the San Francisco–Oakland Bay Bridge to the northwest of the project site. U.S. 101 also connects San Francisco and the North Bay via the Golden Gate Bridge via surface streets on Van Ness Avenue or Franklin Street and Lombard Street. Van Ness Avenue and Lombard Street are part of the Citywide Pedestrian Network outlined in the Transportation Element of the *San Francisco General Plan*.

Special Events

Currently, the Pier 70 site hosts approximately 50 special events per year, which include evening happy hours, music concerts, fairs, and markets. Attendance levels can vary widely, but occasionally (up to approximately four times per year) the largest events can draw up to 40,000 people. These events typically occur outside of the traditional peak periods for analysis, but at times create localized congestion around the Pier 70 site.

For all events held at the Pier 70 site, the event sponsor must obtain special permits from the Port of San Francisco, and, if required, the City. As part of the permitting process, the event sponsor must include a plan for managing travel to and from the event safely and with minimal effect on the surrounding neighborhoods. These management strategies may include special event shuttles, promotion of transit services, and parking management, such as valet parking.

Background Vehicle Miles Traveled in San Francisco and Bay Area

Many factors affect travel behavior. These factors include density, diversity of land uses, design of the transportation network, access to regional destinations, distance to high-quality transit, development scale, demographics, and transportation demand management.[2] Typically, low-density development at great distance from other land uses, located in areas with poor access to non-private vehicular modes of travel, generates more automobile travel compared to development located in urban areas, where a higher density, mix of land uses, and travel options other than private vehicles are available.

Given the travel behavior factors described above, San Francisco (in the aggregate) has a lower average VMT ratio than the nine-county San Francisco Bay Area region (hereinafter, the region). In addition, for the same reasons, different areas of the city have different VMT ratios and some areas of the City have lower VMT ratios than other areas of the city.

These geographic based differences in VMT that are associated with different parts of the city and region are identified in transportation analysis zones (TAZs). TAZs are used by planners as part of transportation planning models for transportation analysis and other planning purposes. The TAZs vary in size from single city blocks in the downtown core, multiple blocks in outer neighborhoods, to even larger zones in historically industrial areas like the Hunters Point Shipyard.

The project site is primarily located in and comprises most of the area in TAZ 559 and is generally the industrial area east of Illinois Street, south of Terry A Francois Boulevard and 16th Street, and north of 24th Street. The location of the project site is close to major transit services and facilities, bicycle and pedestrian networks and facilities, and diversity and density of land uses. A project located in TAZ 559 would have substantially reduced vehicle trips and shorter vehicle distance, and thus, reduced VMT, when compared to other areas of the region.

This is demonstrated by comparing data on average VMT for residential, office, and retail uses in the region and the specific project site TAZ, TAZ 559. Thus, the following VMT rates are identified for each by category of use:

Regional VMT: For residential development, the regional average daily VMT per capita is 17.2.[3] For office and retail development, regional average daily work-related VMT per employee is 19.1 and 14.9, respectively.

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[2] California Smart-Growth Trip Generation Rates Study, Appendix A, University of California, Davis Institute of Transportation Studies, March 2013.

[3] Includes the VMT generated by the Proposed Project (www.sftransportationmap.org, accessed October 3, 2016).

TAZ 559 VMT: The average VMT estimates for each use category in TAZ 559 are projected to be substantially lower than the regional value. For residential development, the TAZ 559 average daily VMT per capita is 8.8. For office and retail development, the TAZ 559 average daily VMT per capita (measured in terms of employees) is 14.6 and 10.8, respectively. For retail uses, the Transportation Authority uses trip-based analysis, which counts VMT from individual trips to and from the project (as opposed to entire chain of trips). A trip-based approach, as opposed to a tour-based approach, is necessary for retail projects because a tour is likely to consist of trips stopping in multiple locations, and summarizing tour VMT to each location would over-estimate VMT.[4,5]

Table 4.E.3: Existing Daily Vehicle Miles Traveled per Capita includes a summary of the daily VMT per capita for the region and for the transportation analysis zone in which the project site is located, TAZ 559.

Table 4.E.3: Existing Daily Vehicle Miles Traveled per Capita

Land Use	Bay Area Regional Average	TAZ 559
Households (Residential)	17.2	8.8
Employment (Office)	19.1	14.6
Visitors (Retail)	14.9	10.8

Source: San Francisco Planning Department, sftransportationmap.org, Accessed October 3, 2016.

Transit Facilities

The project site is served by local transit provided by the San Francisco Municipal Railway (Muni), operated by the San Francisco Municipal Transportation Agency (SFMTA). Muni provides light rail service near the project site on Third Street and bus service on other nearby streets. Most regional transit services are generally not within walking distance of the project site but can be reached by bicycle or from various Muni lines. Regional transit provides service to the East Bay via the Bay Area Rapid Transit rail service (BART), Alameda-Contra Costa Transit buses (AC Transit), and ferries; the North Bay via Golden Gate Transit buses and ferries; and the

[4] To state another way: a tour-based assessment of VMT at a retail site would consider the VMT for all trips in the tour, for any tour with a stop at the retail site. If a single tour stops at two retail locations, for example, a coffee shop on the way to work and a restaurant on the way back home, then both retail locations would be allotted the total tour VMT. A trip-based approach allows analysts to apportion all retail-related VMT to retail sites without double-counting.

[5] San Francisco Planning Department, *Executive Summary: Resolution Modifying Transportation Impact Analysis*, Appendix F, Attachment A, March 3, 2016.

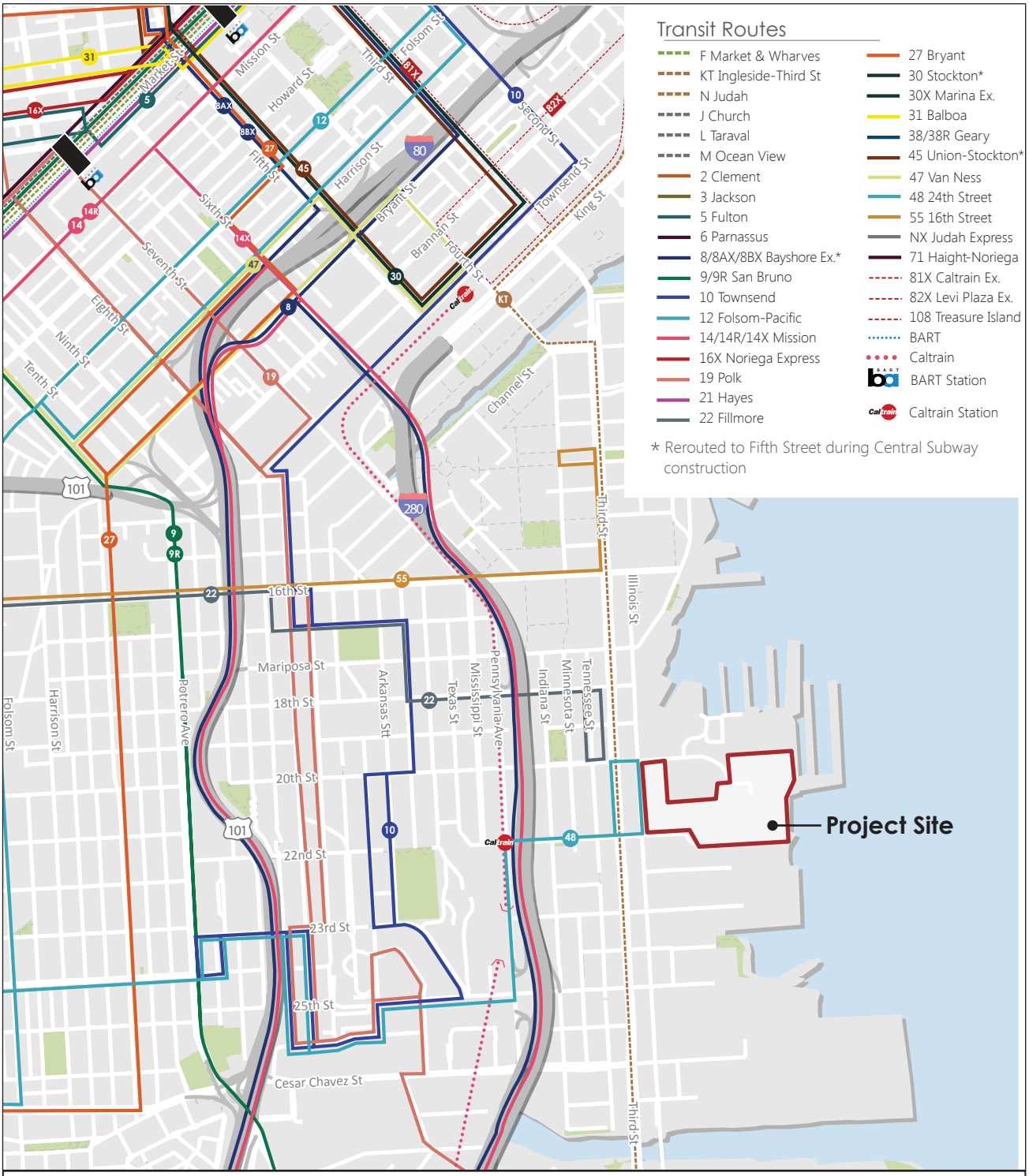
Peninsula and South Bay via Caltrain and BART rail service and San Mateo County Transit (SamTrans) buses. The project site is approximately 2.5 miles south of Market Street BART stations and the Ferry Building and approximately 2.25 miles south of the Temporary Transbay Terminal served by AC Transit. The 22nd Street Caltrain station located under the I-280 freeway structure between Indiana and Pennsylvania streets is within walking distance (approximately 0.25 mile west) of the project site. Figure 4.E.2: Existing Transit Network presents the local and regional transit routes in the transportation study area and in the Mission and South of Market (SOMA) neighborhoods.

Muni

Muni provides transit service within the City and County of San Francisco, including bus (both diesel and electric trolley), light rail (Muni Metro), cable car, and electric streetcar lines. Muni operates a number of bus and rail lines in the project vicinity. Table 4.E.4: Local Muni Operations presents the six Muni routes with stops located within approximately 1 mile of the project site and transportation study area as of March 2015. The closest Muni stops to the project site are on Third Street at 20th Street.

Muni transit operations in the transportation study area were evaluated using two methods: capacity utilization and screenlines. Capacity utilization relates the number of passengers per transit vehicle to the design capacity of the vehicle. A capacity utilization analysis was conducted for the routes providing direct access to the project site based on each route's peak capacity utilization at its maximum load point (MLP), obtained from SFMTA's automated passenger count (APC) database in September/October 2013. The MLP is the location where the route has its highest number of passengers relative to its capacity. In general, the MLP for Muni routes is not located in the transportation study area for the Proposed Project but is located closer to Downtown.

Capacity utilization during the a.m. and p.m. peak hours was determined at the MLP for each route serving the study area. The capacity per vehicle includes both seated and standing capacity, where standing capacity is between 30 and 80 percent of seated capacity (depending on the specific transit vehicle configuration). The capacity of a light rail vehicle is 119 passengers; the capacity of a historic streetcar is 70 passengers; and the capacity of a standard bus is 63 passengers.



Source: Fehr and Peers (2016)

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PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.E.2: EXISTING TRANSIT NETWORK

Table 4.E.4: Local Muni Operations

Route	A.M. Peak Weekday Headways (7:00 a.m.-9:00 a.m.)[1]	P.M. Peak Weekday Headways (4:00 p.m.-6:00 p.m.)[1]	Hours of Operation	Neighborhoods Served by Route
KT Ingleside / Third Street Light Rail	9	9	4:00 a.m.-1:30 a.m.	Balboa Park, Market Street, Mission Bay, Visitacion Valley
10 Townsend	15	20	5:00 a.m.-12:30 a.m.	Potrero Hill, China Basin, Financial District, Pacific Heights
19 Polk	15	15	5:00 a.m.-1:30 a.m.	Hunter's Point, Mission, SOMA, Nob Hill
22 Fillmore	9	8	24 hours per day	Marina, Fillmore, Portrero Hill
48 Quintara / 24th Street	10	12	24 hours per day	SOMA, Mission, Sunset
55 16th Street[2]	15	15	6:00 a.m.-12:00 a.m.	Mission District, Mission Bay, Potrero Hill

Note:

[1] Headway is scheduled time between transit vehicles, presented in minutes.
[2] As discussed later in this section, the 55 16th Street is a relatively new, interim route designed to provide service along 16th Street until the 22 Fillmore is extended into Mission Bay. The Proposed Project's impact analysis is based on conditions after the 22 Fillmore extension is complete; therefore, no additional discussion of ridership data for the 55 16th Street is provided in this section.

Source: Muni, 2015; prepared by Fehr & Peers, 2015

Table 4.E.5: Muni Peak Hour Load and Capacity Utilization by Route presents the a.m. and p.m. peak ridership and capacities at MLPs for transit routes serving the study area for both inbound (toward Downtown) and outbound (away from Downtown) directions. (For purposes of this discussion, inbound and outbound refer to the standard SFMTA conventions, and in some cases because of the way routes are arranged, outbound may be toward Downtown relative to the Proposed Project.) For the individual routes evaluated, the MLP used is the maximum load between the project site and Market Street, since that is where the majority of project-related trips would be destined, and not necessarily inclusive of the MLP of the entire route. The 10 Townsend Inbound records passenger loads that exceed 85 percent capacity utilization, which is SFMTA's standard maximum acceptable utilization, in the a.m. and p.m. peak hour. Other routes operate within SFMTA's capacity utilization threshold (between the project site and Market Street). Immediately adjacent to the study area, capacity utilization is generally lower than the utilization at the MLP.

Table 4.E.5: Muni Peak Hour Load and Capacity Utilization by Route

Route	AM				PM			
	Maximum Load Point	Passenger Load[1]	Peak Hour Capacity[2]	Capacity Utilization	Maximum Load Point	Passenger Load[1]	Peak Hour Capacity[2]	Capacity Utilization
KT Ingleside/Third (IB)[3]	Embarcadero / Brannan Street	381	793	48%	Embarcadero / Folsom Street	314	793	40%
KT Ingleside/Third (OB)	Embarcadero / Folsom Street	310	793	39%	Embarcadero / Folsom Street	550	793	69%
10 Townsend (IB)	Second Street / Townsend Street	244	270	**90%**	Pacific Street / Stockton Street	168	189	**88%**
10 Townsend (OB)	Pacific Avenue / Mason Street	208	252	82%	Second Street / Townsend Street	153	189	80%
19 Polk (IB)	Larkin Street / O'Farrell Street	188	252	75%	Seventh Street / Howard Street	180	252	71%
19 Polk (OB)	Eighth Street / Howard Street	160	252	63%	Eighth Street / Mission Street	168	252	66%
22 Fillmore (IB)	16th Street / Guerrero Street	293	420	70%	16th Street / Folsom Street	293	473	61%
22 Fillmore (OB)	16th Street / Mission Street	267	420	63%	Fillmore Street / Grove Street	278	473	58%
48 Quintara/24th Street (IB)	24th Street / Guerrero Street	221	302	73%	24th Street / Mission Street	180	315	57%
48 Quintara/24th Street (OB)	24th Street / Folsom Street	245	315	77%	24th Street / Folsom Street	205	315	65%

Notes:
IB = inbound. OB = outbound.
Bold indicates capacity utilization of 85 percent or greater. Outbound and inbound capacities for the same route may be different due to different headways or vehicle type.
[1] Peak hour ridership.
[2] Total peak period capacity in passengers per hour.
[3] Ridership for the KT Ingleside/Third reflects MLP between project site and Market Street. Actual MLP for the entire route may occur past Market Street; however, most project-related trips on this route would be traveling to destinations along Market Street.

Sources: Fehr & Peers, 2016; San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015 and October 2016

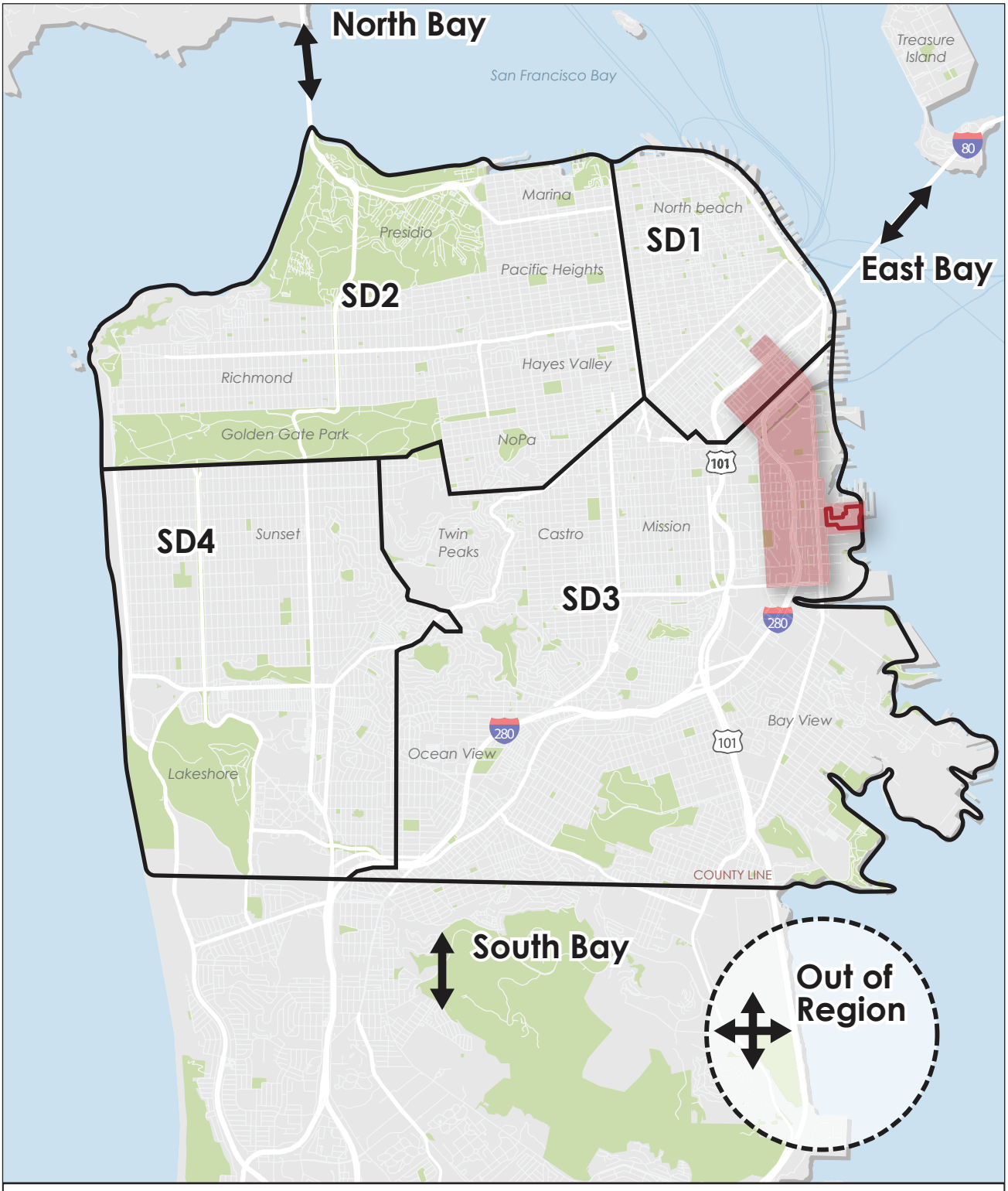
The assessment of existing transit conditions in San Francisco is also performed through the analysis of screenlines. Screenlines are hypothetical lines that would be crossed by persons traveling between Downtown San Francisco and its vicinity (Superdistrict 1) to or from other parts of San Francisco and the region (Superdistricts 2, 3, and 4) (see Figure 4.E.3: San Francisco Superdistricts). The project site is located in Superdistrict 3. Four screenlines—northeast, northwest, southwest, and southeast—have been established in Downtown San Francisco to facilitate the analysis of potential impacts of projects on Muni service. Subcorridors have been established within each screenline. The bus routes and light rail lines used in this screenline analysis are considered the major commute routes from the Downtown area. Other bus routes, such as those with greater than 10-minute headways, are not included due to their generally lower ridership. Transit serving the project site crosses all four Downtown screenlines. Table 4.E.6: Muni Downtown Screenline Groupings shows the groups of Muni routes in each of the Downtown screenlines. In addition to analyzing the subcorridor groups of Muni routes, as noted above, the 22 Fillmore and 48 Quintara / 24th Street bus routes and the KT Ingleside/Third Street light rail line are also presented individually alongside the Downtown screenline information.

Table 4.E.7: Muni Downtown Screenline and Project-Specific Lines – Existing Conditions presents the existing ridership and capacity utilization at the MLP for the routes crossing the Downtown screenlines during the weekday a.m. and p.m. peak hours. The capacity utilization calculation uses a.m. data for the inbound direction and p.m. data for the outbound direction to align with the peak directions of travel and patronage loads for the Muni system to or from the Downtown area during those periods.

As shown in Table 4.E.7, all screenlines currently operate below Muni's 85 percent capacity utilization standard except the southwest screenline in the a.m. peak period (as a result of 102 percent utilization on the subway lines). The Fulton/Hayes subcorridor within the northwest screenline operates above 85 percent capacity utilization in the p.m. peak hour, at 90 percent utilization, but the overall screenline operates within 85 percent capacity utilization and the conditions are considered acceptable. Similarly, the Third Street subcorridor within the southeast screenline operates above 85 percent capacity utilization in the p.m. peak hour, at 99 percent utilization, but the overall screenline operates within 85 percent capacity utilization and conditions are also considered acceptable.

Regional Transit

The area around the project site is served by regional transit systems, which can be reached by bicycle, walking, or local Muni routes. Service is provided by Caltrain, BART, AC Transit, SamTrans, and Golden Gate Transit. Each transit system is briefly described, and information on capacity utilization at regional screenlines is provided.



Source: Fehr and Peers (2015)

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FIGURE 4.E.3: SAN FRANCISCO SUPERDISTRICTS

Table 4.E.6: Muni Downtown Screenline Groupings

Screenline and Subcorridor	Muni Routes Included in Group
Northeast	
Kearny/Stockton	8 Bayshore 30 Stockton 30X Marina Express 41 Union 45 Union-Stockton
Other lines	E Embarcadero F Market & Wharves 10 Townsend 12 Folsom Pacific
Northwest	
Geary	38 Geary 38R Geary Rapid 38AX Geary ‘A’ Express 38BX Geary ‘B’ Express
California	1 California 1AX California ‘A’ Express 1BX California ‘B’ Express
Sutter/Clement	2 Clement
Fulton/Hayes	5 Fulton 5R Fulton Rapid 21 Hayes
Balboa	31 Balboa 31AX Balboa ‘A’ Express 31BX Balboa ‘B’ Express
Southeast	
Third Street	T Third Street
Mission	14 Mission 14R Mission Rapid 14X Mission Express 49 Van Ness-Mission
San Bruno/Bayshore	8 Bayshore 8AX Bayshore ‘A’ Express 8BX Bayshore ‘B’ Express 9 San Bruno 9R San Bruno Rapid
Other lines	J Church 10 Townsend 19 Polk 27 Bryant

Table 4.E.6 Continued

Screenline and Subcorridor	Muni Routes Included in Group
Southwest	
Subway lines	K Ingleside L Taraval M Ocean View N Judah
Haight/Noriega	6 Haight/Parnassus 7 Haight-Noriega 7R Haight-Noriega Rapid 7X Noriega Express NX Judah Express
Other lines	F Market & Wharves

Sources: Fehr & Peers, 2016; San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015

Table 4.E.7: Muni Downtown Screenlines and Project-Specific Lines – Existing Conditions

Screenline	A.M. Peak Hour (Inbound)			P.M. Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
Northeast						
Kearny/Stockton	2,211	3,050	73%	2,245	3,327	68%
Other lines	538	1,141	47%	683	1,078	63%
Screenline Total	*2,749*	*4,191*	*66%*	*2,928*	*4,405*	*67%*
Northwest						
Geary	1,821	2,490	73%	1,964	2,623	75%
California	1,610	2,010	80%	1,322	1,752	75%
Sutter/Clement	480	630	76%	425	630	68%
Fulton/Hayes	1,277	1,680	76%	1,184	1,323	**90%**
Balboa	758	1,019	74%	625	974	64%
Screenline Total	*5,946*	*7,828*	*76%*	*5,519*	*7,302*	*76%*
Southeast						
Third Street	350	793	44%	782	793	**99%**
Mission	1,643	2,509	66%	1,407	2,601	54%
San Bruno/Bayshore	1,689	2,134	79%	1,536	2,134	72%
Other lines	1,466	1,756	84%	1,084	1,675	65%
Screenline Total	*5,147*	*7,193*	*72%*	*4,810*	*7,203*	*67%*

Table 4.E.7 Continued

Screenline	A.M. Peak Hour (Inbound)			P.M. Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
Southwest						
Subway lines	6,330	6,205	**102%**	4,904	6,164	80%
Haight/Noriega	1,121	1,554	72%	977	1,554	63%
Other lines	465	700	67%	555	700	79%
Screenline Total	*7,916*	*8,459*	***94%***	*6,435*	*8,418*	*77%*
Muni Screenlines Total	*21,758*	*27,671*	*79%*	*19,693*	*27,328*	*72%*
Individual Muni Routes[1]						
22 Fillmore (IB)	293	420	70%	293	473	62%
22 Fillmore (OB)	267	420	64%	278	473	59%
48 Quintara/24th Street (IB)	221	302	73%	180	315	57%
48 Quintara/24th Street (OB)	245	315	78%	205	315	65%
KT Ingleside/Third (IB)	381	793	48%	314	793	40%
KT Ingleside/Third (OB)	310	793	39%	550	793	69%

Note:

Bold indicates capacity utilization of 85 percent or greater.

[1] Reflects MLP between project site and Market Street

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

CALTRAIN

Caltrain provides passenger rail service on the Peninsula between San Francisco and Downtown San Jose with several stops in San Mateo County and Santa Clara County. Some service is also available south of San Jose. Caltrain operates either local or express trains between 4:30 a.m. and midnight inbound (northbound) and 5:00 a.m. to midnight outbound (southbound). Caltrain service headways for Limited-Stop and Express ("Baby Bullet") trains during the a.m. and p.m. peak periods are 10 minutes to 40 minutes, depending on the type of train. The peak direction of service is southbound during the a.m. peak period (7:00 a.m. to 9:00 a.m.) and northbound during the p.m. peak period (4:00 p.m. to 6:00 p.m.). Local service is not provided during peak periods.

Caltrain service terminates at the San Francisco Station at King and Fourth streets. In the transportation study area, the Caltrain station on 22nd Street between Indiana Street and Pennsylvania Avenue is within walking distance of the project site. Both stations can be accessed directly by Muni transit and are served by local, limited, and express Baby Bullet trains.

BART

BART provides regional commuter rail service between San Francisco and the East Bay (Pittsburg/Bay Point, Richmond, Dublin/Pleasanton and Fremont), as well as between San Francisco and San Mateo County (Daly City, SFO Airport, and Millbrae). Weekday hours of operation are between 4 a.m. and midnight. During the weekday p.m. peak period, headways are 5 to 15 minutes along each line. Within San Francisco, BART operates underground along Market Street to Civic Center Station where it turns south through the Mission District towards Daly City, running aboveground beginning at the Balboa Park Station. The BART stations nearest to the Proposed Project study area are 16th Street Mission Station, 24th Street Mission Station, Embarcadero Station at Market Street / Main Street, Montgomery Station at Market Street / Second Street, and Powell Station at Market Street / Fifth Street.

AC TRANSIT

AC Transit operates bus service in western Alameda and Contra Costa counties and has routes to San Francisco and San Mateo County. AC Transit operates 33 "Transbay" bus routes between the East Bay and the Temporary Transbay Terminal, temporarily located at Howard and Beale streets in the SOMA area. The Temporary Transbay Terminal lies just outside of the transportation study area and is easily accessible via Muni and regional transit lines. The majority of Transbay service is provided only during commute periods in the peak direction of travel, with headways between buses of 15 to 20 minutes. The peak direction of service is into San Francisco during the a.m. peak period and out of San Francisco during the p.m. peak period. All-day service is provided on a few lines, with headways of approximately 30 minutes.

SAMTRANS

SamTrans operates bus service in San Mateo County. A few SamTrans routes also serve the Temporary Transbay Terminal in Downtown San Francisco, including Routes 292, 397, and KX. Route 292 makes San Francisco stops along Potrero Avenue and Mission Street throughout the day. Headways during the a.m. peak hours are between 15 and 30 minutes, and p.m. peak hour headways are 15 minutes. Route 397 runs along Mission Street in San Francisco and serves the Temporary Transbay Terminal. It is a late-night service route with headways of 1 hour. Route KX operates only during the peak travel periods with 60-minute headways, and travels between the Temporary Transbay Terminal and Redwood City.

GOLDEN GATE TRANSIT

The Golden Gate Bridge, Highway, and Transportation District operates Golden Gate Transit, which provides bus and ferry service between the North Bay (Marin and Sonoma counties) and San Francisco. Golden Gate Transit operates 22 commuter bus routes, nine basic bus routes, and 16 ferry feeder bus routes for ferries to San Francisco. Bus routes operate at headways of 15 to

90 minutes depending on time and day of week and bus type. Near the transportation study area, Golden Gate Transit operates commuter and basic routes on Mission Street, Howard Street, Folsom Street, Sixth Street, and Eighth Street. Golden Gate Transit also operates ferry service between the North Bay and San Francisco, connecting Larkspur and Sausalito with the Ferry Building during the morning and evening commute periods.

REGIONAL TRANSIT SCREENLINES

As is the case for Muni, transit service into and out of San Francisco on regional service providers is examined using a screenline analysis. The existing regional transit screenlines, as described in the *SF Guidelines*, were used to analyze regional transit capacity in the study area. Table 4.E.8: Regional Transit Screenlines – Existing Conditions presents the ridership and capacity utilization at the MLP for the regional screenlines during the weekday a.m. and p.m. peak hours. For regional operators, the MLP is typically at the San Francisco city limit (i.e., the East Bay MLP would occur at the Transbay Tube and on the Bay Bridge; the North Bay MLP would occur at the Golden Gate Bridge; and the South Bay MLP would occur at the southern city border). Inbound travel (into Downtown San Francisco) is analyzed during the a.m. weekday peak period, and outbound travel (out of Downtown San Francisco) is analyzed during the p.m. weekday peak period.

For regional transit providers (except for BART), the established capacity utilization threshold is equal to the number of seated passengers per vehicle. For BART, the established capacity utilization threshold is 107 passengers per car, which includes all seats and accounts for some standees. All of the regional transit operators have a 1-hour load factor standard of 100 percent, which would indicate that all seats are full. As a result, the Planning Department uses 100 percent capacity utilization as a threshold of significance for determining peak period transit demand impacts to regional transit.

As shown in Table 4.E.8, BART currently experiences over-capacity conditions in both the a.m. and p.m. peak hours to and from the East Bay. Specifically, BART's capacity utilization on the East Bay Regional Screenline is 109 percent in the a.m. peak hour and 107 percent in the p.m. peak hour. As a result, the regional screenline between San Francisco and the East Bay is over its capacity utilization threshold in the a.m. peak hour. All other regional screenlines operate within their designated capacity utilization thresholds.

Table 4.E.8: Regional Transit Screenlines – Existing Conditions

Regional Screenline	A.M. Peak Hour (Inbound)			P.M. Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
East Bay						
BART	25,399	23,256	**109%**	24,488	22,784	**107%**
AC Transit	1,568	2,829	55%	2,256	3,926	57%
Ferries	810	1,170	69%	805	1,615	50%
Screenline Total	27,777	27,255	**102%**	27,549	28,325	97%
North Bay						
Golden Gate Transit Bus	1,330	2,543	52%	1,384	2,817	49%
Ferries	1,082	1,959	55%	968	1,959	49%
Screenline Total	*2,412*	*4,502*	*54%*	*2,352*	*4,776*	*49%*
South Bay						
BART	14,150	19,367	73%	13,500	18.900	71%
Caltrain	2,171	3,100	70%	2,377	3,100	77%
SamTrans	255	520	49%	141	320	44%
Ferries	-	-	-	-	-	-
Screenline Total	*16,576*	*22,987*	*72%*	*16,018*	*22,320*	*72%*
Regional Screenlines Total	*46,765*	*54,744*	*85%*	*45,919*	*55,421*	*83%*

Note:
Bold indicates capacity utilization of 100 percent or greater.

Sources: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015 and October 2016

Pedestrian Facilities

A qualitative evaluation of existing pedestrian conditions was conducted during field visits to the transportation study area in May 2015. The field visits revealed a lack of pedestrian facilities at some of the 37 existing study intersections, including locations that are missing sidewalks, missing crosswalks, missing Americans with Disabilities Act (ADA) accessible curb ramps, and lacking pedestrian countdown signals. Additionally, several locations have multiple turning lanes, such as dual right-turn lanes, that make pedestrian crossing difficult. Although some signals do not provide pedestrian countdown signals, at a minimum, basic pedestrian signal heads (with or without countdown indications) are currently provided at all signalized study intersections except at 20th Street and Illinois Street (although, as noted elsewhere in this document, that signal is currently operating in flashing red mode, indicating an all-way stop). In total, 16 of the 37 existing intersections are missing at least one pedestrian curb ramp at a

crosswalk terminus. At six intersections, the crosswalks were closed due to construction during the field visits.

General pedestrian impediments observed across the study area include:

- Narrow sidewalks;
- Intersections with no crosswalks;
- Construction zones that reduce sidewalk width or close crosswalks, at times for extended periods;
- Lack of ADA accessible curb ramps or use of shared diagonal curb ramps at intersection corners;
- Freeway on- and off-ramps with short pedestrian crossing phases and/or high vehicle volumes turning into crosswalks across multiple traffic lanes; and
- Long distances between intersections, particularly in the north-south direction, limiting crossing opportunities.

In the northern part of the transportation study area, in the SOMA neighborhood just north of Mission Creek, the blocks are fairly large and some streets are relatively wide, often with four travel lanes. The City has been making improvements to some SOMA streets, such as Townsend Street west of Fourth Street, to improve the pedestrian environment; although many streets remain very automobile-oriented.

Pedestrian facilities generally are most complete in the area bounded by King Street, Bryant Street, The Embarcadero, and Seventh Street. The majority of intersections in this area have adequate curb ramps and crosswalks, and only single turning lanes. One exception within that area is the intersection of Fourth and King streets, which is challenging for pedestrians due to a number of factors. The KT Third/Ingleside light rail station is in the middle of Fourth Street, south of King Street; the N Judah light rail station is in the middle of King Street, west of Fourth Street; and the Fourth and King Caltrain Station (the system's northern terminus and busiest station) is on the northwest corner of the intersection. Additionally, there is a double right-turn lane from southbound Fourth Street to westbound King Street; King Street becomes the I-280 freeway one block west. The high volume of pedestrians crossing at all legs of this intersection, transferring between transit routes at three different transit stations, while traffic attempts to enter or exit I-280 at King Street, creates a substantial number of conflicts between modes, particularly pedestrians and automobiles. The project site is more than 1 mile from this intersection, and it is unlikely that many project-generated pedestrian trips or vehicle trips would use this intersection, except for users of the Proposed Project's shuttle system if shuttles stop near this location (see "Project Features" discussion, pp. 4.E.41-4.E.47, for more details). Improvements are planned and under construction for this intersection as part of construction of the Central Subway through signal retiming and reduction in auto travel lanes to provide right-of-way for the light rail. This

will likely reduce the number of pedestrian/vehicle conflicts at the intersection. These improvements are expected to be complete by 2019.

The central part of the study area, in Mission Bay, is largely under construction or planned for future construction. As a result, pedestrian facilities can be discontinuous in some areas; however, the overall Mission Bay Redevelopment Plan will result in a well-connected pedestrian network with more pedestrian-scale block sizes and street designs.

In the southern part of the study area, in the Dogpatch neighborhood, the north/south blocks are very long, while the east/west blocks are shorter. This portion of the study area is closest to the project site, and would be where most of the Proposed Project's pedestrian trips travel. General pedestrian impediments in this part of the study area are most prevalent along Illinois Street, Pennsylvania Avenue, Indiana Street, 16th Street, and Mariposa Street. On Mariposa Street, many intersections lack crosswalks. This causes pedestrians to have to walk a long distance before being able to cross Mariposa Street safely. Some of these issues, including new crosswalks, will be addressed by the planned improvements along Mariposa Street to widen the street, add left-turn lanes, and create a new signalized intersection at Owens Street. These improvements are being implemented separately as part of the overall Mission Bay Redevelopment Plan. Similarly, Pennsylvania Avenue also presents particularly challenging pedestrian environments, with numerous freeway on- and off-ramps, narrow or missing sidewalks, missing crosswalks, and largely industrial or auto-centric land uses. There are no pedestrian facilities at the I-280 on- and off-ramps at Pennsylvania Avenue, and the sidewalks along Pennsylvania Avenue between Cesar Chavez Street and 23rd Street are either very narrow with many obstacles such as utility poles or they are missing altogether. On 16th Street, construction on the south side of the street limits pedestrian movement at Owens Street.

Illinois Street is the other location in the southern part of the project study area lacking complete facilities. Specifically, Illinois Street between 20th and 18th streets (streets providing primary access to the project site) has gaps in the sidewalk, which is reflective of the area's industrial roots. These gaps make some areas difficult for pedestrians to traverse and make pedestrian access to the project site challenging.

The existing condition on the project site has limited pedestrian facilities with few sidewalks or crosswalks. Currently, pedestrian volumes around the project site are generally low. There is more activity along Third Street, particularly at light rail stops. There is also a fair amount of pedestrian activity along 22nd Street related to the shops and cafes between Illinois Street and Indiana Street, and west of Third Street related to the 22nd Street Caltrain Station. The project site is not on the pedestrian high injury network identified in the Vision Zero SF initiative (see "Vision Zero" under Regulatory Framework on p. 4.E.38, below).

Bicycle Circulation

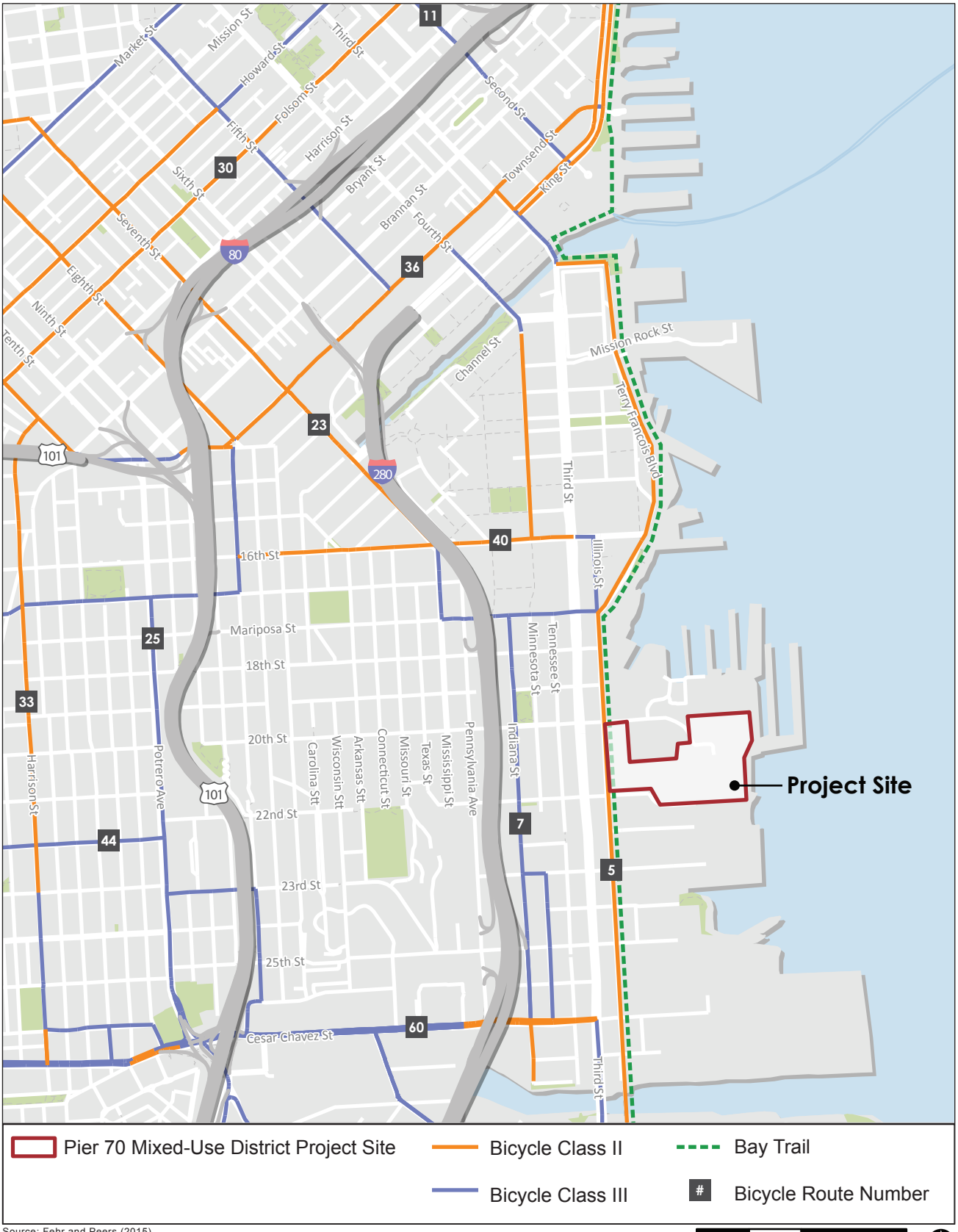
Bicycle facilities in the transportation study area consist of bicycle paths, separated bicycle lanes, and bicycle routes. Bicycle paths (Class I) provide a completely separated right-of-way for the shared use of cyclists and pedestrians. These facilities are off-street and minimize cross-flow traffic, but they can be adjacent to an existing roadway. Separated bicycle lanes (Class II) provide a striped, marked, and signed bicycle lane separated from vehicle traffic. These facilities are located on roadways and reserve a minimum of 4-5 feet of space for exclusive bicycle traffic. Class II lanes can sometimes include a buffer between the auto travel lane and the bicycle lane. Bicycle routes (Class III) provide a shared travel lane marked and signed for shared use with motor vehicle traffic. These facilities may or may not be marked with "sharrows," a stencil painted on the surface of a travel lane showing a bicycle on several arrows pointing in the direction of travel, to emphasize that the roadway space is shared.

Current on-street bicycle facilities, as designated by the San Francisco Bikeway Network Map (2013),[6] are shown on a map of the project vicinity in Figure 4.E.4: Existing Bicycle Network. Bicycle volume counts were conducted during the weekday a.m. and p.m. peak periods (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively) in September 2013 and January 2014. The majority of the study area is flat with limited changes in grades, facilitating bicycling within and through the area.

The following bicycle lanes and routes are found in the transportation study area:

- Route 5 runs through the study area along Terry A Francois Boulevard and Illinois Street. It is signed and striped as a Class II bicycle lane.
- Route 7 runs along Indiana Street in the study area, connecting to Mariposa Street in the north and to Third Street via Cesar Chavez Street in the south. It is designated a Class III bicycle route.
- Route 23 runs north-south in the study area along Seventh Street to Mariposa Street via Mississippi Street and terminates at Illinois Street. It is signed and striped as a Class II bicycle lane.
- Route 36 runs east-west along Townsend Street from The Embarcadero to Eighth Street and then west along 14th Street as a Class II bicycle lane.
- Route 40 runs east-west in the study area along 16th Street as a Class II bicycle lane and terminates in the east at Third Street. It continues west through the Twin Peaks neighborhood until it terminates at the Great Highway via Kirkham Street through the Sunset neighborhood.
- Route 60 runs east-west in the study area along Cesar Chavez Boulevard. It is signed and striped as a Class II bicycle lane between Third Street and Pennsylvania Avenue and is designated a Class III bicycle route west of Pennsylvania Avenue.

[6] San Francisco Municipal Transportation Agency, San Francisco Bikeway Network Map, available on line at https://www.sfmta.com/sites/default/files/maps/One%20Page.pdf, accessed November 18, 2015.



PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.E.4: EXISTING BICYCLE NETWORK

The San Francisco Bay Trail runs along Illinois Street from Cargo Way to Terry A Francois Boulevard at Mariposa Street and adjacent to the project site between 20th and 22nd streets. The Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. It will connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major toll bridges in the region. To date, approximately 340 miles of the alignment have been completed. Route 5 is part of the Bay Trail. Within San Francisco, the portion of the Bay Trail planned between Mission Creek and the southern City limits is referred to as the Blue Greenway. The Blue Greenway is generally planned to be a Class I facility that travels along the waterfront. The project site is not on the bicycle high injury network identified as part of the Vision Zero SF initiative.

Loading Facilities

The project site is currently occupied by self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, artists' studios, and office spaces. To access the project site, trucks use Illinois Street from I-280 via 18th Street, Mariposa Street, 23rd Street, 25th Street, or Cesar Chavez Street. Currently, the roads providing immediate access to the project site tend to have low vehicle and pedestrian activity, making maneuvering to enter and exit the project site relatively easy without blocking traffic or affecting pedestrians.

Loading activity at the loading docks in the project site vicinity was observed during the morning (10:00 a.m. to 11:30 a.m.) and afternoon (4:00 p.m. to 5:30 p.m.) of a typical weekday. Trucks were observed to be on Illinois Street between 18th Street and 23rd Street throughout the day. There are currently no on-street loading spaces on the block of Illinois Street between 20th Street and 22nd Street.

There are about 25 loading docks along the frontage of the American Industrial Center (AIC) building on the west side of Illinois Street (across from the project site) between 20th Street and 22nd Street, though during observations conducted in January 2016, much of this area was used for parking private vehicles and small vans rather than for loading activities. Approximately eight loading docks near the middle of the block between 20th and 22nd streets appeared to be available for loading activities, but trucks were only observed at two or three of the docks, and trucks entering and exiting the docks were infrequent, particularly during the peak hours on the adjacent streets. Six trucks were observed during the morning (between approximately 10 – 11:30 a.m.), three of which did not pull into the loading docks, instead illegally using the sidewalk and/or the bike lane during the pick-up or delivery activity (typically about 5 minutes in duration). In the afternoon (between approximately 4 – 5:30 p.m.), four trucks were observed at the loading docks, two of which illegally used the sidewalk and/or bike lane for at least 15 minutes instead of pulling into a loading dock. In addition, two vans were observed illegally loading on the sidewalk in front of the southernmost loading docks and three mid-sized

automobiles used the loading docks for several minutes for delivery / pick-up. The informal loading activity, blocking the sidewalk and/or bike lane, creates potential conflicts with pedestrians and bicyclists, as the west side of Illinois Street is one elongated driveway apron with no raised curb and there is a Class II bicycle lane on both sides of Illinois Street, between Cargo Way and Terry A Francois Boulevard.

Emergency Access

Emergency transport vehicles typically use major streets through the transportation study area when heading to and from an emergency and/or emergency facility. Arterial roadways allow emergency vehicles to travel at higher speeds and provide enough clearance space to permit other traffic to maneuver out of the path of the emergency vehicle and yield the right-of-way. Five San Francisco Fire Department fire stations are located in or near the study area: Station 8 (Bluxome Street at Fourth Street, 1.5 miles from the project site), Station 25 (Third Street at Cargo Way, 0.9 mile from the project site), Station 29 (16th Street at Vermont Street, 1.4 miles from the project site), Station 37 (Wisconsin Street at 22nd Street, 0.8 mile from the project site), and the new Station 4 in the Public Safety Building at 1245 Third Street (0.8 mile from the project site) that opened in early 2015. The University of California, San Francisco (UCSF) Mission Bay Medical Center is located in the study area, four blocks north and two blocks west of the project site, to the north of 16th Street between Owens and Third streets. San Francisco General Hospital, with the region's main trauma center, is located approximately 1 mile west of the project site on Potrero Avenue at 23rd Street; the driving distance is more than 2 miles, as the east-west streets west of I-280 are generally discontinuous and do not connect directly to Potrero Avenue between 17th and Cesar Chavez streets.

BASELINE CONDITIONS

The analyses in CEQA documents typically present existing and existing-plus-project scenarios to isolate the impacts of the Proposed Project by comparing conditions with the Proposed Project to existing conditions. However, in the Pier 70 transportation study area, unusual aspects of the surrounding conditions warrant a different approach. Multiple land development projects and transportation infrastructure improvements are either recently completed, under construction, or approved and funded and expected to be under construction or completed by the time the Proposed Project is under construction. Because the area is changing rapidly, and there are known development and infrastructure projects underway, a baseline other than existing conditions is appropriate for the analyses presented in this section. An analysis based on existing conditions would be uninformative and misleading to the decision makers and the public. The baseline includes projects that were under construction at the time the Notice of Preparation (NOP) was published or that have been approved and funded and are reasonably likely to be completed by the time the Proposed Project is under construction. Traffic and transit trip generation and assignment for projects included in the Baseline conditions were obtained from

those projects' respective transportation impact analyses, and added to existing conditions traffic volumes and transit ridership. The local transit capacity improvements, such as the Central Subway, were added to existing conditions to provide a reasonable baseline for the analysis of transit impacts.[7]

The baseline projects are listed in Section 4.A, Introduction to Chapter 4, on pp. 4.A.5-4.A.12. They include the UCSF Hospital and Mission Bay Hall, the Public Safety Building, the Italian International School, and the 20th Street Historic Core adaptive reuse development, plus eight private residential and mixed-use development projects, two new open spaces, the Central Subway project, the new Muni route 55 16th Street, a new transit-only lane on 16th Street, and street improvements along Owens and Mariposa streets at the I-280 ramps.

No changes from Existing Conditions to Baseline Conditions have been identified for the pedestrian network, loading facilities, or emergency services access, except for those immediately adjacent to and a part of the improvements listed above (e.g., new sidewalks and crosswalks at the Mariposa Street / I-280 ramps intersections associated with the widening of Mariposa Street).

There are other known projects in the transportation study area that are under consideration, such as the proposed new Arena for the Golden State Warriors and the Mission Rock development project on Seawall Lot 337. The Arena project was approved subsequent to the completion of the transportation analysis, and the Mission Rock development project has not yet been approved; therefore, they are not included in the baseline but are considered in the cumulative impact analyses.

Transit Baseline

Transit conditions are expected to change in the transportation study area over the next several years. The Central Subway will provide a connection from the Caltrain station at Fourth Street / King Street to Chinatown. The new connection will be a subway that will serve major employment and population centers in San Francisco. As part of the Central Subway initial phase, service frequencies will be improved, substantially increasing capacity. Ground was broken on the project in 2010, and the subway extension is expected to be open to the public by 2019. Because the T Third is a major transit connection to the project site, and the Central Subway is under construction and anticipated to be operational when the first building at the Proposed Project site is occupied, the Central Subway has been included in the Baseline Conditions transit analysis. Other improvements are described below.

[7] The Muni transit analysis is based on an SF-CHAMP model run that includes ridership projections for 2020 and planned capacity assuming that the Central Subway project and other approved and funded transit improvements would be in operation by the time the Proposed Project is approved and under construction.

The new 55 16th Street bus route began operating in the Mission Bay area in January 2015, providing interim service between Mission Street and Third Street and north on Third Street to Mission Bay Boulevard North until the 22 Fillmore extension has been completed. The 22 Fillmore bus route will extend east on 16th Street to Third Street and on Third Street north to a turnaround within Mission Bay. The 33 Stanyan bus would be re-routed from Potrero Avenue to provide service on 18th Street presently provided by the 22 Fillmore. A loop at 18th Street is also planned for the T Third Muni Metro line to provide a turnaround for Central Subway trains during peak periods and special events, so that a "short line" can be operated, increasing the capacity on the T Third line between Chinatown and the 18th Street loop.[8] Although not adjacent to the Proposed Project site, the year 2020 forecasts also assume implementation of the Geary Bus Rapid Transit (BRT) project along Geary Boulevard.

Peak hour ridership and capacity utilization at the Muni Downtown screenlines and the three project-specific routes serving the project site for both the a.m. and p.m. peak hours under baseline conditions are presented in Table 4.E.9: Muni Downtown Screenlines and Project-Specific Routes – Baseline Conditions. The ridership data provided are from a 2020 model run of the San Francisco Chained Activity Model Process (SF-CHAMP) provided by the San Francisco County Transportation Authority (Transportation Authority).[9] The model run was checked to determine the land uses assumed for Pier 70 compared to an existing model (2012) and a build-out model (2040). There was substantial growth in the traffic analysis zone that includes Pier 70, and adjustments were made to the transit ridership to account for the growth in the Baseline Conditions Scenario. The capacity utilization calculation uses a.m. data in the inbound direction and p.m. data in the outbound direction, which aligns with the peak directions of travel and patronage loads for the Muni system to or from the Downtown area during those periods. As shown in the table, all screenlines operate below Muni's 85 percent capacity utilization standard except for the southwest screenline in the a.m. peak hour. The southwest screenline shows 92 percent capacity utilization overall in the a.m. peak hour, in part as a result of the 97 percent utilization on the subway lines subcorridor. Although the capacity utilization for the southwest screenline and the subway lines subcorridor exceed the 85 percent capacity utilization threshold in the a.m. peak hour under Baseline Conditions, the capacity utilization on both the subway lines subcorridor and the southwest screenline is reduced compared to Existing Conditions because of increased frequency due to Muni Forward improvements and Central Subway / T Third Short Line improvements. The Other Lines subcorridor within the southeast screenline shows 90 percent capacity utilization in the a.m. peak hour, but since the southeast screenline shows 64 percent capacity utilization overall in the a.m. peak hour, conditions on that screenline are considered acceptable.

[8] As explained in Section 4.A, Introduction to Chapter 4, pp. 4.A.11-4.A.12, the T Third short line loop has been approved by the SFMTA Board of Directors and is currently under construction.

[9] SF CHAMP Model version originally prepared for Scenario 8 of the Central Corridor Study.

Table 4.E.9: Muni Downtown Screenlines and Project-Specific Routes – Baseline Conditions

Screenline	A.M. Peak Hour (Inbound)			P.M. Peak Hour (Outbound)		
	Ridership	**Capacity**	**Utilization**	**Ridership**	**Capacity**	**Utilization**
Northeast						
Kearny/Stockton	2,273	3,157	72%	2,444	3,327	73%
Other lines	710	1,141	62%	903	1,155	78%
Screenline Total	*2,983*	*4,298*	*69%*	*3,347*	*4,482*	*75%*
Northwest						
Geary	2,302	3,764	61%	2,913	3,621	80%
California	1,436	2,010	71%	1,349	1,752	77%
Sutter/Clement	514	630	82%	523	630	83%
Fulton/Hayes	1,505	2,237	67%	1,544	1,838	84%
Balboa	553	1,008	55%	537	974	55%
Screenline Total	*6,310*	*9,649*	*65%*	*6,866*	*8,815*	*78%*
Southeast						
Third Street	1,025	3,808	27%	1,836	3,808	48%
Mission	2,155	2,632	82%	1,927	2,632	73%
San Bruno/Bayshore	1,867	2,197	85%	1,761	2,134	83%
Other lines	1,577	1,756	**90%**	1,213	1,675	72%
Screenline Total	*6,624*	*10,393*	*64%*	*6,737*	*10,249*	*66%*
Southwest						
Subway lines	6,783	7,020	**97%**	5,433	6,804	80%
Haight/Noriega	1,178	1,596	74%	1,065	1,596	67%
Other lines	474	560	85%	655	840	78%
Screenline Total	*8,435*	*9,176*	***92%***	*7,153*	*9,240*	*77%*
Muni Screenlines Total	*24,352*	*33,515*	*73%*	*24,103*	*32,786*	*74%*

Table 4.E.9 Continued

Screenline	A.M. Peak Hour (Inbound)			P.M. Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
Individual Muni Routes						
22 Fillmore IB[1]	501	882	57%	436	939	46%
22 Fillmore OB[1]	340	882	39%	400	939	43%
48 Quintara/24th Street IB	119	252	47%	160	252	63%
48 Quintara/24th Street OB	199	252	79%	213	252	85%
T Third IB	1,097	3,808	29%	1,940	3,808	51%
T Third OB	1,931	3,808	51%	1,742	3,808	46%

Notes:

1. *Ridership and capacity for the 22 Fillmore include both the 22 Fillmore and the 33 Stanyan routes, since they will both provide complimentary service to and from the project area.*

Bold indicates capacity utilization of 85 percent or greater.

Source: Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study, Appendix B to this EIR, for Transit Line Capacity Calculations.

The regional transit screenline ridership and capacity utilization with Baseline Conditions are shown in Table 4.E.10: Regional Transit Screenlines – Baseline Conditions. As under Existing Conditions, the a.m. peak hour screenline to the East Bay would continue to exceed the 100 percent capacity utilization threshold while all other screenlines would continue to operate within their capacity utilization standards. The East Bay screenline shows 109 percent capacity utilization in the a.m. peak hour for BART and 102 percent overall capacity utilization in the a.m. peak hour. The East Bay screenline shows 105 percent capacity utilization in the p.m. peak hour for BART and 96 percent overall capacity utilization in the p.m. peak hour.

Bicycle Network Baseline

The San Francisco Bicycle Plan (Bike Plan) includes several near-term improvements to the City's bicycle network within the transportation study area. The new bicycle lanes on Second Street between King Street and Market Street are included in the EIR's Baseline Conditions. These bicycle lanes are part of an initial phase of the Second Street Improvement project. The initial phase of bicycle lanes was completed in 2016, and a longer-term project to widen sidewalks and construct one-way cycle tracks is scheduled to begin construction in early 2017. Other near-term improvements in the Bike Plan on Fifth Street, Fremont Street, and 16th Street, are not funded and therefore are included in Cumulative Conditions.

Table 4.E.10: Regional Transit Screenlines – Baseline Conditions

Regional Screenline	A.M. Peak Hour (Inbound)			P.M. Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
East Bay						
BART	28,000	25,680	**109%**	27,000	25,680	**105%**
AC Transit	1,596	2,829	56%	2,297	3,926	59%
Ferries	818	1,170	70%	813	1,615	50%
Screenline Total	*30,414*	*29,679*	***102%***	*30,110*	*31,221*	*96%*
North Bay						
Golden Gate Transit Bus	1,344	2,543	53%	1,399	2,817	50%
Ferries	1,088	1,959	56%	973	1,959	50%
Screenline Total	*2,432*	*4,502*	*54%*	*2,372*	*4,776*	*50%*
South Bay						
BART	16,000	21,400	75%	15,000	21,400	70%
Caltrain	2,258	3,100	73%	2,472	3,100	80%
SamTrans	266	520	51%	147	320	46%
Ferries	-	-	-	-	-	-
Screenline Total	*18,524*	*25,020*	*74%*	*17,619*	*24,820*	*71%*
Regional Screenlines Total	*51,370*	*29,201*	*87%*	*50,101*	*60,817*	*82%*

Note:
Bold indicates capacity utilization of 100 percent or greater.

Sources: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015 and October 2016

REGULATORY FRAMEWORK

This section provides a summary of the plans and policies of the City and County of San Francisco, and regional, State, and Federal agencies that have policy and regulatory control over the project site. These plans and policies include the *San Francisco General Plan*, the *San Francisco Bicycle Plan*, and the Transit First Policy.

FEDERAL

There are no Federal transportation regulations applicable to the Proposed Project.

STATE

Senate Bill 743 and Public Resources Code Section 21099

In 2013, the California State Legislature passed Senate Bill (SB) 743, which added Section 21099 to CEQA. Section 21099(b)(1) requires that the State Office of Planning and Research (OPR) develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects within transit priority areas. Specifically, SB 743 called on OPR to study the removal of automobile delay as a metric for evaluating transportation impacts and to develop alternative metrics that better match the State's policies around promoting infill development, public health through active transportation, and greenhouse gas emissions.

Additionally, SB 743 requires changes to the analysis of parking impacts for certain urban infill projects in transit priority areas.[10] Public Resources Code Section 21099(d), effective January 1, 2014, provides that "… parking impacts of a residential, mixed-use residential, or employment center project on an infill site located within a transit priority area shall not be considered significant impacts on the environment." Accordingly, parking is no longer to be considered in determining whether a project has the potential to result in significant environmental effects for projects that meet all three criteria established in the statute.

REGIONAL

San Francisco Bay Trail Plan

The Association of Bay Area Governments (ABAG) administers the San Francisco Bay Trail Plan. The Bay Trail is a multi-purpose recreational trail that, when complete, would encircle San Francisco Bay and San Pablo Bay with a continuous 500-mile network of bicycling and hiking trails; to date, about 340 miles of the alignment have been completed. The 2005 Gap Analysis Study, prepared by ABAG for the entire Bay Trail area, attempted to identify the remaining gaps in the Bay Trail system; classify the gaps by phase, county, and benefit ranking; develop cost estimates for individual gap completion; identify strategies and actions to overcome gaps; and present an overall cost and timeframe for completion of the Bay Trail system. The Bay Trail in this portion of San Francisco is along Illinois Street on the western border of the project site. Therefore, the 2005 Gap Analysis Study did not identify the project site as a gap segment of the Bay Trail. The Port's *Pier 70 Preferred Master Plan* articulates the goal of including the project site as part of the Bay Trail network.

[10] A "transit priority area" is defined as an area within 0.5 mile of an existing or planned major transit stop. A "major transit stop" is defined in California Public Resources Code Section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. A map of San Francisco's Transit Priority Areas is available online at http://sfmea.sfplanning.org/Map%20of%20San%20Francisco%20Transit%20Priority%20Areas.pdf.

LOCAL

Transit First Policy

In 1998, the San Francisco voters amended the City Charter (Charter Article 8A, Section 8A.115) to include a Transit First Policy, which was first articulated as a City priority policy by the Board of Supervisors in 1973. The Transit First Policy is a set of principles which underscore the City's commitment that travel by transit, bicycle, and foot be given priority over the private automobile. These principles are embodied in the policies and objectives of the Transportation Element of the *San Francisco General Plan*. All City boards, commissions, and departments are required, by law, to implement transit-first principles in concluding City affairs.

San Francisco General Plan

The Transportation Element of the *San Francisco General Plan* is composed of objectives and policies that relate to the eight aspects of the citywide transportation system: General Regional Transportation, Congestion Management, Vehicle Circulation, Transit, Pedestrian, Bicycles, Citywide Parking, and Goods Management. The Transportation Element references San Francisco's "Transit First" Policy in its introduction, and contains the following objectives and policies that are directly pertinent to consideration of the Proposed Project:

Objective 2: Use the transportation system as a means for guiding development and improving the environment.

- Policy 2.1: Use rapid transit and other transportation improvements in the city and region as the catalyst for desirable development, and coordinate new facilities with public and private development.
- Policy 2.4: Organize the transportation system to reinforce community identity, improve linkages among interrelated activities, and provide focus for community activities.
- Policy 2.5: Provide incentives for the use of transit, carpools, vanpools, walking, and bicycling and reduce the need for new or expanded automobile and automobile parking facilities.

Objective 8: Maintain and enhance regional pedestrian, hiking, and biking access to the coast, the Bay, and ridge trails.

- Policy 8.1: Ensure that the Coast Trail, Bay Trail, and Ridge Trail remain uninterrupted.

Objective 11: Establish public transit as the primary mode of transportation in San Francisco and as a means through which to guide future development and improve regional mobility and air quality.

Policy 11.3: Encourage development that efficiently coordinates land use with transit service, requiring that developers address transit concerns as well as mitigate traffic problems.

Objective 14: Develop and implement a plan for operational changes and land use policies that will maintain mobility and safety, despite a rise in travel demand that could otherwise result in system capacity deficiencies.

Policy 14.2: Ensure that traffic signals are timed and phased to emphasize transit, pedestrian, and bicycle traffic as part of a balanced multimodal transportation system.

Policy 14.3: Improve transit operation by implementing strategies that facilitate and prioritize transit vehicle movement and loading.

Policy 14.4: Reduce congestion by encouraging alternatives to the single-occupancy auto through the reservation of right-of-way and enhancement of other facilities dedicated to multiple modes of transportation.

Policy 14.7: Encourage the use of transit and other alternative modes of travel to the private automobile through the positioning of building entrances and the convenient location of support facilities that prioritizes access from these modes.

Objective 16: Develop and implement programs that will efficiently manage the supply of parking at employment centers throughout the city so as to discourage single-occupant ridership and encourage ridesharing, transit and other alternatives to the single-occupant automobile.

Policy 16.5: Reduce parking demand through limiting the absolute amount of spaces and prioritizing the spaces for short-term and ride-share uses.

Policy 16.6: Encourage alternatives to the private automobile by locating public transit access and ride-share vehicle and bicycle parking at more close-in and convenient locations on-site, and by locating parking facilities for single-occupant vehicles more remotely.

Objective 18: Establish a street hierarchy system in which the function and design of each street are consistent with the character and use of the adjacent land.

Policy 18.2: Design streets for a level of traffic that serves, but will not cause a detrimental impact on, adjacent land uses or eliminate the efficient and safe movement of transit vehicles and bicycles.

Policy 18.5: Mitigate and reduce impacts of automobile traffic in and around parks and along shoreline recreation area.

Objective 23: Improve the city's pedestrian circulation system to provide for efficient, pleasant, and safe movement.

Policy 23.2: Widen sidewalks where intensive commercial, recreational, or institutional activity is present and where residential densities are high.

Policy 23.3: Maintain a strong presumption against reducing sidewalk widths, eliminating crosswalks, and forcing indirect crossings to accommodate automobile traffic.

Policy 23.6: Ensure convenient and safe pedestrian crossings by minimizing the distance pedestrians must walk to cross a street.

Objective 24: Improve the ambiance of the pedestrian environment.

Objective 28: Provide secure and convenient parking facilities for bicycles.

Policy 28.1: Provide secure bicycle parking in new governmental, commercial, and residential developments.

Policy 28.3: Provide parking facilities which are safe, secure, and convenient.

Objective 30: Ensure that the provision of new or enlarged parking facilities does not adversely affect the livability and desirability of the city and its various neighborhoods.

Policy 30.1: Assure that new or enlarged parking facilities meet need, locational, and design criteria.

Policy 30.5: In any large development, allocate a portion of the provided off-street parking spaces for compact automobiles, vanpools, bicycles, and motorcycles commensurate with standards that are, at a minimum, representative of their proportion of the city's vehicle population.

Policy 30.8: Consider lowering the number of automobile parking spaces required in buildings where Class I bicycle parking is provided.

Objective 34: Relate the amount of parking in residential areas and neighborhood commercial districts to the capacity of the city’s street system and land use patterns.

Policy 34.1: Regulate off-street parking in new housing so as to guarantee needed spaces without requiring excesses and to encourage low auto ownership in neighborhoods that are well served by transit and are convenient to neighborhood shopping.

Policy 34.3: Permit minimal or reduced off-street parking for new buildings in residential and commercial areas adjacent to transit centers and along transit preferential street.

Objective 35: Meet short-term parking needs in neighborhood shopping districts consistent with preservation of a desirable environment for pedestrians and residents.

Policy 35.1: Provide convenient on-street parking specifically designed to meet the needs of shoppers dependent upon automobiles.

Policy 35.2: Assure that new neighborhood shopping district parking facilities and other auto-oriented uses meet established guidelines.

San Francisco Bicycle Plan

The *San Francisco Bicycle Plan* (*Bike Plan*) describes a City program to provide the safe and attractive environment needed to promote bicycling as a transportation mode. The *Bike Plan* identifies the citywide bicycle route network, and establishes the level of treatment (i.e., Class I, Class II, or Class III facility) on each route. The *Bike Plan* also identifies near-term improvements that could be implemented within the next 5 years, as well as policy goals, objectives, and actions to support these improvements. It includes long-term improvements, and minor improvements that would be implemented to facilitate bicycling in San Francisco.

Better Streets Plan

The *San Francisco Better Streets Plan* focuses on creating a positive pedestrian environment through measures such as careful streetscape design and traffic calming measures to increase pedestrian safety. The *Better Streets Plan* includes guidelines for the pedestrian environment, defined as the areas of the street where people walk, sit, shop, play, or interact. Generally speaking, the guidelines are for design of sidewalks and crosswalks; however, in some cases the *Better Streets Plan* includes guidelines for other areas of the roadway, particularly at intersections.

Vision Zero

Vision Zero is a policy adopted by both the San Francisco Board of Supervisors and SFMTA to eliminate all traffic deaths in San Francisco by the year 2024. The goal of Vision Zero is also to reduce severe injury inequities across neighborhoods, transportation modes, and populations. Some actions SFMTA has and will take to improve pedestrian safety include safer signal timing at intersections, adding "continental" crosswalks (crosswalks with zebra striping), "leading" pedestrian signals that allow pedestrians to get a head start at signalized intersections, red zones at intersections to improve visibility, and pedestrian bulbs to shorten pedestrian crossing distances.

Transportation Sustainability Program

The Transportation Sustainability Program is an effort to reconcile the increasing demand for transportation within San Francisco with the very limited right-of-way available. The Program aims to achieve a more efficient transportation system through a three-pronged approach. The Program calls for improved investment in transportation infrastructure, alignment of the City's environmental review processes with City policies, and adopting new practices supporting a shift in travel from single-occupant vehicles to other, more space-efficient modes of travel. Two of the three prongs of the Program have been adopted by the Board of Supervisors and or Planning Commission, an updated and expanded transportation impact fee (Transportation Sustainability Fee) and a change to the City's transportation significance thresholds. The third prong, a Transportation Demand Management (TDM) ordinance, is described further below.

Transportation Demand Management Ordinance

The San Francisco Planning Commission has recently recommended that the Board of Supervisors approve an amendment to the City's Planning Code requiring most new development projects in San Francisco to incorporate "design features, incentives, and tools" intended to reduce VMT. New development projects would be required to choose from a menu of options to develop an overall plan of TDM elements. Each development project's TDM plan will require routine monitoring and reporting to the Planning Department to demonstrate compliance. As of the preparation of this document, the ordinance has been continued at the Board of Supervisors Land Use and Transportation Committee to January 23, 2017.

Climate Action Plan

In response to overwhelming scientific evidence suggesting that human behavior is accelerating climate change, the City adopted a *Climate Action Plan* to address actions the City could take to reduce its contribution to climate change. The *Climate Action Plan* describes the effects that climate change may have on San Francisco based on scientific research and presents an inventory of San Francisco's contribution to greenhouse gas emissions – the leading human contributor toward accelerating climate change. The *Plan* also recommends a greenhouse gas reduction target and describes specific measures that the City could take to reach its target – including recommendations for reducing trips by automobile.

Waterfront Transportation Assessment

SFMTA and the Transportation Authority have been working with the other City agencies, regional transportation providers, and community members to assess future transportation system needs along the east side of the City, beginning in 2012. Phase 2 of the Waterfront Transportation Assessment (WTA) studies the SOMA Area, Mission Bay, and the Central Waterfront south to Cesar Chavez Street.[11] The Phase 2 report (WTA Phase 2) was completed in August 2015.

The purpose of the WTA is to identify future transportation facility needs to accommodate growth in the City and an expected increase in travel demand of approximately 50 percent in the SOMA and Central Waterfront area by the year 2040. The WTA Phase 2 concludes that mode shifts from car to other modes will be necessary if growth in transportation demand is to be accommodated, and that those shifts will need to be not only from car to transit but also from car to bicycle and walking. The necessary mode shifts are likely to occur only if there are

[11] SFMTA and the Transportation Authority, *Waterfront Transportation Assessment, Phase 2 SoMa, Mission Bay, Central Waterfront Transportation Analysis Final Report*, August 2015.

improvements to the transportation facilities (bicycle, pedestrian, and transit infrastructure) and their safety coupled with TDM strategies.[12]

The WTA is a planning tool with technical analysis support. The analysis supporting the conclusions accounts for the growth in jobs and population estimated to occur with implementation of the Pier 70 Mixed-Use District Project in the Central Waterfront Area.[13] The WTA does not present policies or objectives that would directly affect land use decisions. It does present recommendations for improvements that could support population and job growth in the Central Waterfront neighborhoods.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The significance criteria listed below are organized by mode to facilitate the transportation impact analysis; however, the transportation significance thresholds are essentially the same as the ones in the environmental checklist (Appendix G of the State *CEQA Guidelines*) and incorporate San Francisco Planning Commission Resolution 19579 and supporting materials.[14] For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the proposed project would result in a significant impact on transportation and circulation:

- **Vehicle Miles Traveled** –
  - The project would have a significant effect on the environment if it would cause substantial additional VMT.
  - The project would have a significant effect on the environment if it would substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network.
- **Transit** – A project would have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in delays or operating costs such that significant adverse impacts in transit service levels could result. With the Muni and regional transit screenlines analyses, the project would have a significant effect on the transit provider if project-related transit trips would cause the capacity utilization standard to be exceeded during the peak hour. For screenlines that already operate above the utilization standard during the peak hour, a project would have a significant effect on the transit provider if project-related transit trips were more than 5 percent of total transit trips during the peak hour.

[12] SFMTA and the Transportation Authority, *Waterfront Transportation Assessment, Phase 2 SoMa, Mission Bay, Central Waterfront Transportation Analysis Final Report*, August 2015, p. 19.
[13] SFMTA, the Transportation Authority, ARUP, *Nelson/Nygaard*, *Waterfront Transportation Assessment, Phase 2 SoMa, Mission Bay, Central Waterfront Transportation Analysis, Appendix A: Technical Report*, August 2015, p. 5.
[14] San Francisco Planning Department, *Updated TIA Significance Thresholds*, September 13, 2016.

- **Pedestrians** – A project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.
- **Bicycles** – A project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.
- **Loading** – A project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site loading facilities or within convenient on-street loading zones, and if it would create potentially hazardous traffic conditions or significant delays affecting traffic, transit, bicycles, or pedestrians.
- **Traffic** – The project would have a significant adverse impact if it would cause major traffic hazards.
- **Emergency Vehicle Access** – A project would have a significant effect on the environment if it would result in inadequate emergency access.
- **Construction** – Construction of the project would have a significant effect on the environment if, in consideration of the project site location and other relevant project characteristics, the temporary construction activities' duration and magnitude would result in substantial interference with pedestrian, bicycle, or vehicle circulation and accessibility to adjoining areas thereby resulting in potential hazardous conditions.
- **Parking** – The project would have a significant effect on the environment if it would result in a substantial parking deficit that would create hazardous conditions or significant delays affecting traffic, transit, bicycles, or pedestrians and where particular characteristics of the project or its site demonstrably render use of other modes infeasible.

As described in the NOP/IS (provided in Appendix A in this EIR), the project site is not located within an area covered by an airport land use plan or within 2 miles of a public airport or public use airport; nor is it within the vicinity of a private airstrip. Therefore, implementation of the Proposed Project or its variants and alternatives would not result in a change in air traffic patterns, including either an increase in traffic levels, obstructions to flight, or a change in location, that results in substantial safety risks, and these issues are not addressed in this EIR.

PROJECT FEATURES

Development Program

The Proposed Project would develop the 28-Acre Site and the Illinois Parcels (the Hoedown Yard and 20th/Illinois Site). It provides for a phased and flexible land use program that would allow some of the parcels to be developed for either primarily commercial uses or residential uses. Two parcels are proposed to be designated for district structured parking, but either residential or commercial uses could be developed on one of the parcels and residential uses could be developed on the other, instead of parking. Thus, two development scenarios are analyzed

equally to provide the maximum range of transportation impacts from development of either more commercial or more residential space.

As noted in the Environmental Setting section, the project site currently hosts approximately 50 special events per year, which include evening happy hours, music concerts, fairs, and markets. Attendance levels can vary widely, but occasionally the largest events can draw up to 40,000 people.

The Proposed Project also includes open space programming elements that are anticipated to include art and cultural events, outdoor fairs, festivals and markets, outdoor film screenings, night markets, food events, street fairs or festivals, lecture series, art exhibitions, and theater performances during weekdays and weekends. Typical events at the Proposed Project, occurring up to an estimated three times per month, could have attendance of approximately 500 to 750 people, while larger-scale events, occurring approximately four times per year, could have attendance of up to 5,000 people.

As shown in Table 2.3: Project Summary - Maximum Residential Scenario, in Chapter 2, Project Description, p. 2.29, the Maximum Residential Scenario would provide up to 3,025 residential units (2,630,000 gross square feet [gsf]), 1,102,250 gsf of commercial space, 479,980 gsf of retail/arts/light-industrial (RALI) space[15], 9 acres of open space, and up to 3,370 off-street parking spaces. Existing buildings to be renovated and converted would house about 237,800 gsf of the residential, commercial, and/or RALI space. Total development would be about 4,212,230 gsf.

Table 2.4: Project Summary - Maximum Commercial Scenario, in Chapter 2, Project Description, p. 2.31, presents the land uses and square footage for the Maximum Commercial Scenario. This scenario would provide 1,645 residential units (1,430,000 gsf), 2,262,350 gsf of commercial space, almost the same amount of RALI space at 486,950 gsf, and up to 3,496 off-street parking spaces. The same buildings would be renovated and converted to residential, commercial, and/or RALI space as in the Maximum Residential Scenario. Total development would be about 4,179,300 gsf. The same 9 acres of open space is proposed as for the Maximum Residential Scenario.

For analysis purposes, it has been assumed that 33 percent of the total number of residential units under each scenario would be studio or one-bedroom units and 67 percent would be two or more bedrooms for each scenario.

[15] For transportation analysis purposes, the RALI space has been assumed to include production/distribution/repair (PDR) space, retail uses, and restaurant uses. The PDR space accounts for the light industrial uses and a portion of the arts uses that are not classed as retail. Restaurant and retail uses have trip generation and distribution rates that are different from each other and from light industrial and office uses and therefore needed to be separated from the other RALI uses.

Parcels C-1 and C-2 that could be developed with District Parking rather than residential or commercial uses have been analyzed as residential in the Maximum Residential Scenario and as residential and commercial in the Maximum Commercial Scenario to provide the highest amount of trip generation for each scenario. Rooftop open space has been assumed for these two parcels in both the Maximum Residential Scenario and Maximum Commercial Scenario

Transportation Improvements Assumed in the Analysis

Chapter 2, Project Description, summarizes the transportation and circulation improvements that are included in the Proposed Project, and presents the Transportation Plan, which includes a discussion of TDM strategies to discourage the use of automobiles and encourage transit and other modes of transportation. The roadway network improvements, transit improvements, bicycle circulation improvements, pedestrian circulation improvements, on-street loading provisions, and the TDM Plan that are assumed in the transportation and circulation analyses of the Proposed Project are reiterated and expanded on below.

Roadway Network Improvements

The project site would be accessible via Illinois Street at 20th Street, at 22nd Street, and at a new 21st Street connection. The existing 20th Street and 22nd Street rights-of-way within the project site would be improved. Three new internal north-south streets are proposed to break the site into more typical city blocks, these are, Michigan Street, Louisianan Street, and Maryland Street (see Figure 2.5: Proposed SUD Land Use Program, in Chapter 2, Project Description, p. 2.22). All streets would have sidewalks, ranging from 9 to 18 feet wide, all of which would have a minimum throughway of at least 6 feet. All streets except the portion of new Louisiana Street between 20th and 21st streets would be two-way with a single travel lane in each direction. That block of Louisiana Street would be one-way southbound with a single travel lane. Streets are proposed to be designed to the minimum width feasible to calm traffic and increase pedestrian safety while still accommodating fire trucks, transit vehicles, deliveries, and other required design vehicles – generally, between 27 and 38 feet in length. No improvements are proposed outside of the project site, other than signalization of the intersection of Illinois Street with 21st Street.

The Proposed Project would include a shared public way on Maryland Street between 21st Street and 22nd Street. This shared street would have limited vehicular traffic and would give priority to pedestrians over automobiles. This street would consist of a single shared paved surface with no curbs or gutters. The street would include raised domes, or another similar feature, to delineate the boundary between the pedestrian zone and traffic to allow for safe travel by those with visual impairment. Automobiles could access it from the adjoining streets by a curb-cut similar to a typical driveway. The proposed shared public way would allow for temporary closures of the street to vehicular traffic for markets and events. The shared public way is adjacent to the open space connecting to the Blue Greenway and the San Francisco Bay. The Blue Greenway is the

portion of the San Francisco Bay Trail that extends between Mission Creek and the southern City limits, through the Proposed Project, as discussed in "Bicycle Circulation Improvements" below.

Transit Improvements

The overall transit network serving the Proposed Project is shown in Figure 2.16: Proposed Roadway Network, in Chapter 2, Project Description, p. 2.50. No changes to the Muni system are proposed, although 22nd Street has been designed such that Muni could directly serve the project site if SFMTA chose to re-route an existing line, such as the 48 24th Street.

The Proposed Project would include a shuttle service, to be operated and maintained by a Pier 70 Transportation Management Agency (TMA), to connect the Pier 70 Mixed-Use District to regional transit hubs, like the Fourth & King Caltrain Station and 16th Street / Mission Street BART station.[16] Although the shuttle would not be operated by a transit agency, such as SFMTA, the shuttle is intended to improve connectivity for regional transit use; the shuttle service is not intended to replicate or duplicate Muni service for local trips. The shuttle service is part of the TDM Plan discussed below. It would be operated by the TMA through a third-party service provider and would have no fare associated with it. The TMA would be led by a board of directors that could include the Port, SFMTA, and representatives of various buildings constructed at the site. Exact routes and operating schemes would be determined at a later time, depending on factors such as peak period traffic congestion along specific streets and BART and Caltrain service plans, and schedules at specific stations. However, the service would be provided at a minimum of every 15 minutes during the extended weekday commute periods (7:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7:00 p.m.) and would serve both trips leaving and accessing the project site during each peak period.

Bicycle Circulation Improvements

The bicycle circulation network in the vicinity of the Proposed Project, including improvements associated with the Proposed Project, is shown in Figure 2.18: Proposed Bicycle Network, in Chapter 2, Project Description, p. 2.54. The Proposed Project would include a separated bicycle and pedestrian facility along 20th Street at the water's edge to extend the Bay Trail/Blue Greenway continuously along the shore of the site. At the northern end, the Bay Trail would extend via 20th Street to Georgia Street and 19th Street. At the southern end, the trail would temporarily access Illinois Street via 22nd Street, but would be designed to connect to any future extension of the Bay Trail south of the project site. Class II bicycle lanes and Class III shared lanes are proposed throughout the Proposed Project. No improvements are proposed outside of the project site.

[16] A TMA is generally an organization of residents and/or businesses formed to promote or operate transportation programs for their members.

Pedestrian Circulation Improvements

Minimum sidewalk widths have been proposed for each street, ranging from 9 feet to 18 feet. The Bay Trail/Blue Greenway would extend through the project site and serve pedestrians as well as bicyclists, as noted above under "Bicycle Circulation Improvements." Curb extensions are planned at key locations on corners and mid-block locations wherever feasible in order to increase pedestrian visibility, shorten crossing distance, and decrease vehicle speeds. No improvements are proposed outside of the project site, except for signalization of the intersection of Illinois Street with 21st Street, which would also include construction of new curb ramps.

Loading Supply

Michigan Street, Louisiana Street, and new 21st Street are proposed to be designed as primary on-street loading corridors, with heavy loading (trucks up to 40 feet long) accommodated at Michigan Street and Louisiana Street near the Historic Core.

On- or off-street loading spaces would be required for each use based on the square footage of the buildings. All residential and arts/light industrial buildings greater than 50,000 square feet would have one to two loading spaces, which could be on- or off-street. Retail uses greater than 50,000 square feet would typically have one off-street loading space per every 25,000 square feet of gross leasable area. Commercial uses would typically have one to three off-street loading spaces. All buildings less than 50,000 square feet would use on-street loading.

Generally, the freight loading requirements for retail uses would be similar to the Planning Code requirements for retail uses in the Eastern Neighborhoods Mixed-Use District. The Proposed Project's freight loading requirements for commercial and RALI uses generally would be less than the requirements in the Planning Code for the Eastern Neighborhoods Mixed-Use District. The Proposed Project's freight loading requirements for residential uses would be similar to requirements in the Planning Code for residential development in the Downtown Residential District – the only portion of the City with residential off-street freight loading requirements in the Planning Code.

On-street loading spaces would be able to accommodate WB-40 vehicles (wheelbase of 40 feet) and would be a minimum of 75 feet long. Off-street loading spaces would be a minimum of 12 feet wide, 14 feet high, and 35 feet long, consistent with requirements in the Planning Code. The Maximum Residential Scenario would provide 28 off-street loading spaces and the Maximum Commercial Scenario would provide 25 off-street loading spaces.

There are no specific passenger loading supply requirements and no specific provisions for passenger loading have been identified. However, individual buildings would be able to apply to

SFMTA for a passenger loading zone permit in which on-street parking spaces could be converted to a white "passenger loading" zone.

Transportation Demand Management Plan

The Proposed Project includes a TDM Plan (within the Transportation Plan) that provides a comprehensive strategy to manage the transportation demands it would create. The TDM Plan incorporates transportation planning principles to address the transportation needs of the Proposed Project consistent with San Francisco's Transit First Policy, *Better Streets Plan*, *Climate Action Plan*, and Transportation Sustainability Program and associated policies; to encourage use of transit and other modes of transportation; and to discourage use of single-occupancy automobiles or automobiles in general. The improvements and TDM Plan would be the same for both the Maximum Residential Scenario and the Maximum Commercial Scenario.

While these measures are included as part of the Proposed Project, no attempt has been made to quantify the effect of specific measures at reducing automobile travel in the analysis. This discussion presents two sets of TDM measures: (1) those that are part of the Proposed Project, as described in the TDM Plan and summarized below, and (2) those that may be implemented as Mitigation Measures for Air Quality impacts as part of Mitigation Measure M-AQ-1f in Section 4.G, Air Quality, pp. 4.G.47-4.G.50. Although no specific TDM measures are required as part of Mitigation Measure M-AQ-1f, the measure does require the Proposed Project to supplement the measures in the TDM Plan with additional measures to achieve a specific reduction in overall project-generated vehicle trips compared to the forecasts in this chapter.

Key strategies in the TDM Plan include the following:

- Transportation Management Agency. The Project's TDM Plan would be administered and maintained by a TMA. The TMA for the Pier 70 Mixed-Use District Project would be funded by project-generated sources and would be responsible for working with future subtenants of the project site (e.g., employers, residents, etc.) to ensure that they are actively participating in the TDM program. Upon agreeing to lease property at the project site, subtenants would become "members" of the TMA and be able to take advantage of the TDM program services provided through the TMA. The TMA would be led by a board of directors that would be staffed by representatives from diverse stakeholders that could include the Port (as the current property owner), SFMTA (as the public agency responsible for oversight of transportation in the City), and representatives of various buildings that have been constructed at the site. The board of directors may also include representatives from commercial office tenants or homeowners' associations.
- On-site Transportation Coordinator. Day-to-day operations of the TMA would be handled by staff who would work under the high-level direction provided by the board of directors. The lead staff position would serve as the on-site Transportation Coordinator (TC), functioning as the TMA's liaison with subtenants in the implementation of the TDM program and as the TMA's representative in discussions with the City. Duties would include operation of the TMA website and ridematching services, distribution of

transportation information packets, preparation of TDM plans for large special events, development and management of a rewards program for employees who do not drive on their commute, monitoring and reporting, and management of the Proposed Project's shuttle service. The TC position would be funded by the TMA, which is funded through project-generated sources.

- Shuttle service. The TMA would be responsible for provision of shuttle service between the project site and local and regional transit hubs. The TMA is likely to provide this service through a contractual agreement with a third-party shuttle operator, similar to other existing shuttle services. The TMA would be responsible for devising the proposed service plan and ensuring that the proposed connecting shuttle service is operated in a matter that maximizes intermodal coordination with BART and Caltrain. Routes, vehicle size, and frequency would be augmented over build-out of the Proposed Project to respond to demand.
- Bikesharing stations to serve the project site. The TMA would work collaboratively with SFMTA and Bay Area Bike Share (BABS) representatives to finalize the design, location, installation timeline, and funding arrangements for both initial installation and ongoing operation and maintenance of any proposed bikesharing station, if the established BABS program expands into the surrounding area.
- Supplementary components. Supplementary components such as provision of passenger amenities, real-time occupancy data for shared parking facilities, on-street carshare spaces, unbundled parking for residents, and preferential treatment for high-occupancy vehicles would be coordinated and provided through the TMA.

In addition to the day-to-day TDM measures included as part of the Proposed Project, additional strategies may be appropriate for special events held at Pier 70. As noted earlier, events at the project site with the Proposed Project would not be as large as the larger events currently held at the site. However, events occurring approximately three times per month could have an attendance of approximately 500 to 750 people, while larger events, occurring approximately four times per year, could have attendance of up to 5,000 people.

As with how things operate under existing conditions, as explained above on p. 4.E.8 events at the Pier 70 site currently require and would continue to require City permits, and event organizers would continue to develop event-specific TDM Plans to ensure that the flow of people into and out of the site would be managed similar to current conditions.

APPROACH TO ANALYSIS

The section presents the analysis methodologies, the approach to developing the travel demand forecasts for the two project scenarios, and the cumulative 2040 conditions including reasonably foreseeable development projects and transportation improvements.

Analysis Methodology

This section presents the methodology for analyzing transportation impacts and information considered in developing travel demand for the Proposed Project. The impacts of the Proposed

Project on the surrounding roadways were analyzed using the guidelines set forth in the *SF Guidelines* and Planning Commission Resolution 19579 and supporting materials, including a Categorical Exemption Determination, incorporated herein by reference, all of which provide direction for analyzing transportation conditions and identifying the transportation impacts of a proposed project in San Francisco.

The analysis of the Proposed Project was conducted for the Baseline Conditions described above under the "Baseline Conditions" discussion, pp. 4.E.28-4.E.33, plus full build-out of each of the Proposed Project scenarios, and for future year 2040 conditions with build-out of each of the Proposed Project scenarios. The baseline plus project conditions assess the near-term effects of the two scenarios, while the 2040 cumulative plus project scenarios assess the long-term effects of these scenarios in combination with other known and forecast development. The year 2040 was selected because it is the latest year that travel demand forecasts are available from the Transportation Authority travel demand forecasting model, SF-CHAMP.

Senate Bill 743 and Public Resources Code Section 21099

As discussed in Section 4.A, Introduction to Chapter 4, pp. 4.A.3-4.A.5 and above in the Regulatory Framework subsection, p. 4.E.34, Senate Bill 743 amended CEQA by adding Public Resources Code Section 21099 regarding the analysis of parking impacts for certain urban infill projects in transit priority areas.[17] Accordingly, parking is no longer to be considered in determining if a project has the potential to result in significant environmental effects for projects that meet all three criteria established in the statute. The Proposed Project meets all of the criteria, and thus the transportation impact analysis does not consider the adequacy of parking in determining the significance of project impacts under CEQA. However, the Planning Department acknowledges that parking conditions may be of interest to the public and the decision-makers. Therefore, this EIR presents a parking demand analysis for informational purposes and considers any secondary physical impacts associated with constrained supply (e.g., queuing by drivers waiting for scarce on-site parking spaces that affects the public right-of-way) as applicable in the following transportation impact analysis.

Additionally, CEQA Section 21099(b)(1) requires that OPR develop revisions to the *CEQA Guidelines* establishing criteria for determining the significance of transportation impacts of projects within transit priority areas that promote the "reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Potential

[17] A "transit priority area" is defined as an area within one-half mile of an existing or planned major transit stop. A "major transit stop" is defined in California Public Resources Code Section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. A map of San Francisco's Transit Priority Areas is available online at http://sfmea.sfplanning.org/Map%20of%20San%20Francisco%20Transit%20Priority%20Areas.pdf.

metrics OPR may recommend to measure transportation impacts may include vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated. CEQA Section 21099(b)(2) states that upon certification of the revised *CEQA Guidelines* for determining transportation impacts pursuant to Section 21099(b)(1), automobile delay, as described solely by level of service (LOS) or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA. Section 21099(c) provides that OPR also may adopt guidelines with alternative metrics to use for traffic levels of service for transportation impacts that apply outside transit priority areas.

In January 2016, OPR published for public review and comment a *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*[18] (proposed transportation impact guidelines) recommending that transportation impacts for projects be measured using vehicle miles traveled (VMT) as the primary metric. VMT measures the amount and distance that a project might cause people to drive, accounting for the number of passengers within a vehicle.

On March 3, 2016, the San Francisco Planning Commission, by Resolution No. 19579, adopted VMT as the principal criteria for determining transportation impacts. The Planning Commission's resolution:

- Found that OPR's proposed transportation impact guidelines, as described in the OPR Technical Advisory,[19] provide substantial evidence that VMT is an appropriate standard to use in analyzing transportation impacts to protect environmental quality and a better indicator of greenhouse gas, air quality, and energy impacts than automobile delay;
- Found that automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, will no longer be considered a significant impact on the environment pursuant to CEQA, because it does not measure environmental impacts and therefore it does not protect environmental quality;
- Directed the Environmental Review Officer to remove automobile delay as a factor in determining significant impacts pursuant to CEQA for all guidelines, criteria, and list of exemptions, and to update the Transportation Impact Analysis Guidelines for Environmental Review and Categorical Exemptions from CEQA to reflect this change; and
- Directed the Environmental Planning Division and Environmental Review Officer to replace automobile delay with VMT criteria which promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses that are consistent with proposed and forthcoming changes to the *CEQA Guidelines* by OPR.

[18] This document is available online at: https://www.opr.ca.gov/s_sb743.php.

[19] *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA: Implementing Senate Bill 743*, State of California, Governor's Office of Planning and Research, January 20, 2016. Available online at https://www.opr.ca.gov/s_sb743.php.

In connection with the adoption of Planning Commission Resolution No. 19579 adopting VMT to measure transportation impacts, for localized circulation impact analysis (e.g., to analyze potential impacts to walking, bicycling, riding transit, freight and passenger loading, emergency vehicle access, construction site circulation and access, and compliance with local plans, ordinances and policies related to transportation) the Planning Department continues to use trip generation rates and trip distribution identified in the SF Guidelines.[20]

Planning Commission Resolution No. 19579 became effective immediately for all projects that have not received a CEQA determination and all projects that have previously received CEQA determinations but require additional environmental analysis.

Accordingly, this EIR contains a focused discussion of whether the addition of project vehicle trips may impact bicycle or pedestrian safety, transit operations, and emergency and private vehicle access, but does not include a discussion of potential impacts to drivers associated with automobile delay.

Automobile delay may be considered by decision-makers, independent of the environmental review process, as part of their decision to approve, modify, or disapprove the Proposed Project.

Prior to the Planning Commission's action on March 3, 2016, some projects, including the Pier 70 Mixed-Use District Project, were in the process of environmental review, and had substantively completed draft Transportation Impact Studies using methodology and the LOS CEQA significance criteria formerly used by the San Francisco Planning Department (*2002 San Francisco Transportation Impact Analysis Guidelines for Environmental Review* [*SF Guidelines*]). The *Pier 70 Mixed-Use District Project Transportation Impact Study* (TIS) included as Appendix B to this EIR, has been updated to reflect the adopted change from LOS to VMT and the associated removal of automobile delay as a significance criterion. However, Section 7 of the TIS includes a discussion of LOS conditions, including intersections that are estimated to operate at or beyond LOS E or F under project and cumulative conditions, and improvement measures that would address such effects under those conditions. Although no longer part of the CEQA transportation impacts assessment, localized volumes are described in the TIS to inform transportation improvement projects proposed/agreed to by the project sponsor, and to help inform related topics such as air quality and noise.[21]

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[20] San Francisco Planning Department, *Executive Summary: Resolution Modifying Transportation Impact Analysis, Hearing Date: March 3, 2016*, Attachment E: *Screening Criteria for Circulation Analysis and Methodology for Travel Demand,* and Attachment F: *Methodologies, Significance Criteria, Thresholds of Significance, and Screening Criteria for Vehicle Miles Traveled and Induced Automobile Travel Impacts,* which includes an appendix from the San Francisco County Transportation Authority.

[21] See, e.g., Caltrans, *Local Development – Intergovernmental Review Program Interim Guidance: Implementing Caltrans Strategic Management Plan 2015-2020 Consistent with SB 743 (Steinberg, 2013),* approved Sept. 2, 2016, Appendix D, p. 2 ("increased traffic volumes from high-VMT

Vehicle Miles Traveled Analysis

As noted above, the Planning Commission's Resolution No. 19579 is consistent with the direction of CEQA Section 21099(b)(2), and OPR's proposed transportation impact guidelines. Moreover, it is based upon and consistent with the authority and deference CEQA provides to local agencies to identify the methodology to analyze and environmental impact.[22] Residential and office projects located in areas with low VMT, and that incorporate similar features (i.e., sufficient density, mix of uses, transit accessibility) will tend to exhibit similarly low VMT. OPR's Technical Advisory recognizes that there are various methods for assessing VMT, and specifically acknowledged the efficacy of a map-based screening approach. The City uses this approach.

San Francisco, and other lead agencies, such as Oakland and Pasadena, use maps illustrating areas that exhibit below threshold VMT to screen out projects that may not require a detailed VMT analysis. Under this approach, travel demand models or survey data provide the existing residential or office VMT, which can be modified for mixed use projects by using each use-based map as a screen for the respective use-portion of the project, to then develop maps illustrating VMT for different areas in the city. Thus, the maps demonstrate whether a proposed project is in a transportation-efficient location, (e.g., transit-oriented infill), with safe and adequate access to a multi-modal transportation system and key destinations, and that will help the city, region, and state reach their GHG reduction targets under AB 32.

This mapping approach for VMT screening has also been recently acknowledged in the Caltrans Local Development Intergovernmental Review Program, Interim Guidance, approved September 2, 2016. This Caltrans Guidance provides further support for use of a map-based screening approach. (The Interim Caltrans Guidelines replaces Caltrans' 2002 Guidelines, and is part of Caltrans' effort to support smart growth and efficient development. It is intended to help ensure that greenhouse gas emissions reduction, good community design, improved proximity to key destinations, and a safe multimodal transportation system are all integral parts of the land use decision-making process.)

The Transportation Authority uses SF-CHAMP to estimate VMT by private automobiles and taxis for different land use types within individual TAZs. Travel behavior in SF-CHAMP is calibrated by Transportation Authority staff based on observed behavior from the California Household Travel Survey 2010-2012, Census data regarding automobile ownership rates and county-to-county worker flows, and observed vehicle counts and transit boardings. SF-CHAMP

development and/or high speeds can exacerbate safety concerns . . . that may affect adjacent pedestrian facilities. Similarly, increasing traffic volumes at uncontrolled turn-movement points or in locations without adequate modal separation/refuge can increase the vulnerability for all modes, especially pedestrians and bicyclists").

[22] California Public Resources Code Section 21099(b)(1); 14 Cal. Code Regs., Section 15064(b).

uses a synthetic population, which is a set of individual actors that represents the Bay Area's actual population, who make simulated travel decisions for a complete day. The Transportation Authority uses tour-based analysis for office and residential uses, which examines the entire chain of trips over the course of a day, not just trips to and from the project. For retail uses, the Transportation Authority uses trip-based analysis, which counts VMT from individual trips to and from the project (as opposed to entire chain of trips). A trip-based approach, as opposed to a tour-based approach, is necessary for retail projects because a tour is likely to consist of trips stopping in multiple locations, and the summarizing of tour VMT to each location would over-estimate VMT.[23,24]

The following identifies thresholds of significance and screening criteria used to determine if a land use project or plan would result in significant impacts under the VMT metric.

For residential projects, a project would generate substantial additional VMT if it exceeds the regional household VMT per capita minus 15 percent. This metric is consistent with OPR's proposed transportation impact guidelines stating that a project would cause substantial additional VMT if it exceeds both the existing City household VMT per capita minus 15 percent and existing regional household VMT per capita minus 15 percent. In San Francisco, the City's average VMT per capita (8.4) is lower than the regional average (17.2). Therefore, the City average is irrelevant for the purposes of the analysis.

For office projects, a project would generate substantial additional VMT if it exceeds the regional VMT per employee minus 15 percent.

For retail projects, the Planning Department uses a VMT efficiency metric approach for retail projects: a project would generate substantial additional VMT if it exceeds the regional VMT per retail employee minus 15 percent.

For mixed-use projects, each proposed land use is evaluated independently, per the significance criteria described above.

This approach is consistent with CEQA Section 21099 and the thresholds of significance for other land uses recommended in OPR's *Revised Proposal on Updates to the CEQA Guidelines on*

[23] Retail travel is not explicitly captured in SF-CHAMP, rather, there is a generic "Other" purpose which includes retail shopping, medical appointments, visiting friends or family, and all other non-work, non-school tours. The retail efficiency metric captures all of the "Other" purpose travel generated by Bay Area households. The denominator of employment (including retail; cultural, institutional, and educational; and medical employment; school enrollment, and number of households) represents the size, or attraction, of the zone for this type of "Other" purpose travel.

[24] San Francisco Planning Department, Executive Summary: Resolution Modifying Transportation Impact Analysis, Appendix F, Attachment A, March 3, 2016.

Evaluating Transportation Impacts in CEQA[25] ("proposed transportation impact guidelines"). OPR described a 15 percent threshold below existing development as being "both reasonably ambitious and generally achievable" for the following reasons.

First, Section 21099/SB 743 states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions." SB 743 also states the Legislature's intent that the analysis of transportation in CEQA better promote the State's goals of reducing greenhouse gas emissions. It cites in particular the reduction goals in the Global Warming Solutions Act and the Sustainable Communities and Climate Protection Act, both of which call for substantial reductions. The California Air Resources Board established long-term reduction targets for the largest regions in the tate that ranged from 13 to 16 percent.

Second, Caltrans has developed a statewide VMT reduction target in its Strategic Management Plan. Specifically, it calls for a 15 percent reduction in per capita VMT, compared to 2010 levels, by 2020.

Third, according to the California Air Pollution Control Officers Association (CAPCOA), 15 percent reductions in VMT are typically achievable at the project level in a variety of place types.[26]

Fourth, the *First Update to the AB 32 Scoping Plan* states, "[r]ecognizing the important role local governments play in the successful implementation of AB 32, the initial Scoping Plan called for local governments to set municipal and communitywide GHG reduction targets of 15 percent below then-current levels by 2020, to coincide with the statewide limit."[27]

The VMT significance standards, and a comparison of these standards to TAZ 559, in which the project site is located, are summarized in Table 4.E.11, Daily Vehicle Miles Traveled.

In addition to the map-based screening criterion, OPR has a Proximity to Transit Stations screening criterion that the City uses. OPR recommends that residential, retail, and office projects, as well projects that are a mix of these uses, proposed within 0.5 mile of an existing major transit stop (as defined by CEQA Section 21064.3) or an existing stop along a high quality transit corridor (as defined by CEQA Section 21155) would not result in a substantial increase in VMT. However, this presumption would not apply if the project would: have a floor area ratio of less than 0.75; (2) include more parking for use by residents, customers, or employees of the

[25] This document is available online at: https://www.opr.ca.gov/s_sb743.php, Page III:20.
[26] CAPCOA, *Quantifying Greenhouse Gas Measures*, 2010, p. 55. Available online at https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm.
[27] *First Update to the AB 32 Scoping Plan*, p. 113.

project than required or allowed, without a conditional use; or (3) is inconsistent with the applicable Sustainable Communities Strategy.[28]

Table 4.E.11 Daily Vehicle Miles Traveled

Land Use	Bay Area VMT		TAZ 559
	Regional Average	Regional Average minus 15%	
Households (Residential)	17.2	14.6	8.8
Employment (Office)	19.1	16.2	14.6
Visitors (Retail)	14.9	12.6	10.8

Source: San Francisco Planning Department, sftransportationmap.org, Accessed October 3, 2016.

OPR's proposed transportation impact guidelines do not provide screening criteria or thresholds of significance for other types of land uses, other than those projects that meet the definition of a small project, which does not apply to the Proposed Project. Therefore, the Planning Department provides additional screening criteria and thresholds of significance to determine if land uses similar in function to residential, office, and retail would generate a substantial increase in VMT.[29]

The Planning Department applies the Map-Based Screening and Proximity to Transit Station screening criteria to the following land use types:

- Tourist Hotels, Student Housing, Single Room Occupancy Hotels, and Group Housing – Trips associated with these land uses typically function similarly to and generate a comparable number of vehicle trips as multi-family residential uses. Therefore, these land uses are treated as residential for screening and analysis.
- Childcare, K-12 Schools, Medical, Post-Secondary Institutional (non-student housing), and Production, Distribution, and Repair (PDR) – Trips associated with these land uses typically function similarly to office. While some of these uses may have some visitor/customer trips associated with them (e.g., childcare and school drop-off, patient visits, etc.), those trips are often a side trip within a larger tour. For example, the visitor/customer trips are influenced by the origin (e.g., home) and/or ultimate destination (e.g., work) of those tours. Therefore, these land uses are treated as office for screening and analysis.

[28] A project is considered to be inconsistent with the Sustainable Communities Strategy if development is located outside of areas contemplated for development in the Sustainable Communities Strategy.

[29] San Francisco Planning Department, Executive Summary: Resolution Modifying Transportation Impact Analysis, Appendix F, Attachment A, March 3, 2016.

- Grocery Stores, Local-Serving Entertainment Venues, Religious Institutions, Parks, and Athletic Clubs – Trips associated with these land uses typically function similar to retail. Therefore, these types of land uses are treated as retail for screening and analysis.

Induced Automobile Travel Analysis

The Proposed Project is a mixed-use development project that includes the creation of an internal street network, pedestrian and bicycle facilities, traffic calming measures, and intersection traffic control devices including traffic signals and stop controls.

A proposed project would not result in a substantial increase in VMT if it would include the following components and features:

- Active Transportation, Rightsizing (aka Road Diet), and Transit Projects:
  - Infrastructure projects, including safety and accessibility improvements, for people walking or bicycling
  - Installation or reconfiguration of traffic calming devices
  - Creation of new or expansion of existing transit service
  - Creation of new or addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for people walking, bicycling, and, if applicable, riding transit (e.g., by improving neighborhood connectivity or improving safety)
- Other Minor Transportation Projects:
  - Rehabilitation, maintenance, replacement and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
  - Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, or emergency breakdown lanes that are not used as through lanes
  - Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
  - Timing of signals to optimize vehicle, bicycle or pedestrian flow on local or collector streets
  - Addition of transportation wayfinding signage
  - Removal of off- or on-street parking spaces
  - Adoption, removal, or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)

Transit Analysis

The impact of additional transit ridership generated by the Proposed Project on local and regional transit providers was assessed using screenlines. The concept of screenlines is used to describe

the magnitude of travel to or from the greater Downtown area of San Francisco and to compare estimated transit volumes to available capacities. Screenlines are hypothetical lines that would be crossed by persons traveling between Downtown San Francisco and its vicinity (Superdistrict 1) to or from other parts of San Francisco and the region (Superdistricts 2, 3, and 4). Four screenlines have been established in Downtown San Francisco to analyze potential impacts of projects on Muni service: northeast, northwest, southwest, and southeast, with sub-corridors within each screenline. The bus routes and light rail lines used in this screenline analysis are listed in Table 4.E.6, p. 4.E.6, and are considered the major commute routes to and from the Downtown area. Other bus routes, such as those with greater than 10-minute headways, are not included due to their generally lower ridership. Three regional screenlines have been established around San Francisco to analyze impacts on the regional transit agencies: North Bay, East Bay, and Peninsula and South Bay. Both sets of screenlines focus on transit trips into Downtown San Francisco in the morning (inbound) and out of Downtown in the evening (outbound), because these are the most congested directions and times.

In addition, impacts on local Muni transit service were assessed by comparing the projected ridership from each of the project scenarios to the available transit capacity at the MLP of various transit corridors, described above in the subsection on Existing Conditions under the "Transit Facilities" discussion, p. 4.E.10. Capacity utilization for a.m. and p.m. peak hours was determined at the MLP for each route serving the study area. As explained in the "Existing Conditions" section, p. 4.E.11, the MLP for Muni routes is not located in the transportation study area for the Proposed Project but is located closer to Downtown. Capacity utilization relates the number of passengers per transit vehicle to the design capacity of the vehicle.[30] Muni has established a capacity utilization standard of 85 percent, which was applied to the a.m. and p.m. weekday conditions analyzed. Because of the high amount of non-residential use proposed in both the Maximum Residential and Maximum Commercial scenarios, it is expected that many of the trips would be toward the project site in the a.m. peak and away from the project site in the p.m. peak. This directionality is counter to the direction in which the Downtown screenlines are assessed. Furthermore, based on the location of the project site outside of the Downtown screenlines, it is likely that some of the transit trips generated by the Proposed Project that do travel in the peak directions would occur after the MLP, at points where capacity is available. The analysis has not been adjusted to account for this likelihood, and therefore provides a conservative result.

The existing ridership data for the routes providing direct access to the project site were analyzed based on each route's peak capacity utilization at its MLP, obtained from SFMTA's automated

[30] The capacity per vehicle includes both seated and standing capacity, where standing capacity is between 30 and 80 percent of seated capacity (depending upon the specific transit vehicle configuration). The capacity of a light rail vehicle is 119 passengers, the capacity of a historic streetcar is 70 passengers, and the capacity of a standard bus is 63 passengers.

passenger count (APC) database in September/October 2013. The baseline was then calculated using information about the development projects expected to be completed by the time the Proposed Project is undertaken. The transit Baseline Conditions reflect Muni capacity that is expected to be available when the Central Subway project is completed and the T Third short line loop has been constructed to provide additional capacity during peak periods.

Future 2040 cumulative transit ridership projections were developed based on transit growth projections prepared for the Transit Effectiveness Project. Forecast future hourly ridership demand was then compared to expected capacity based on the likely route and headway changes identified in the Muni Forward program to estimate capacity utilization under 2040 cumulative conditions. The transit person-trips forecast to be generated by the Proposed Project were compared to the 2040 cumulative conditions at the screenlines and on specific Muni routes serving the project site.

The Proposed Project was determined to have a significant transit impact if project-generated transit trips would cause screenlines operating at less than the capacity utilization standard under Baseline Conditions to operate at more than the capacity utilization standard. The Proposed Project would also have a significant impact if project-generated transit trips would add more than 5 percent to a screenline or an individual route that already exceeds the capacity utilization standard under Baseline Conditions.

The Proposed Project would have a significant cumulative impact if the addition of Project trips to a Muni screenline or individual route would cause capacity utilization to exceed the 85 percent standard or would add more than 5 percent to a screenline or an individual route that would exceed the 85 percent capacity utilization standard under cumulative conditions without the Proposed Project.

Pedestrian Analysis

Pedestrian trips generated by the Proposed Project include walking trips to and from nearby land uses and to and from the local transit stops and the 22nd Street Caltrain station. A qualitative assessment of pedestrian conditions was conducted to determine whether pedestrian facilities would be adequate to accommodate pedestrian trips and whether any conditions hazardous to pedestrians would be created. No quantitative analysis was performed.

Bicycle Analysis

The transportation analysis includes a qualitative assessment of bicycle conditions as they relate to the project site and bicycle parking, and to bicycle circulation in the transportation study area. No quantitative analysis was performed. The analysis discusses bicycle safety and potential conflicts with traffic. The Proposed Project would result in a significant impact if it would

adversely affect bicycle facilities in the project study area or would create new hazardous conditions for bicycling.

Loading Analysis

The analysis of loading conditions includes quantification of loading demand during the peak hour of loading activities and a comparison of that demand to proposed on- and off-street loading facilities located within the project site. The Proposed Project would have a significant impact if it would result in a loading demand that could not be accommodated within proposed facilities such that potentially hazardous conditions for pedestrians or bicycles were created or substantial traffic or transit delay would occur.

Emergency Access

The qualitative discussion of emergency access addresses access to the project site and access for emergency vehicles within the planned circulation pattern.

Construction Analysis

The construction impact evaluation addresses temporary construction-related traffic from construction workers and materials delivery.

Parking Conditions

As explained in Section 4.A, Introduction to Chapter 4, p. 4.A.3-4.A.5, the EIR does not consider the adequacy of the parking supply in determining the significance of impacts of the Proposed Project. Because parking conditions are of interest to the public and decision-makers, a parking demand analysis is presented for informational purposes. The parking analysis quantifies the Proposed Project's parking demand under the Maximum Residential Scenario and the Maximum Commercial Scenario in relation to the proposed parking supply pursuant to the maximum permitted parking in the *Design for Development*, Section 5.4, Off-Street Parking, p. 152.

Travel Demand Analysis

Travel demand refers to the new vehicle, transit, bicycle, and pedestrian traffic that would be generated by the Proposed Project. Forecasts of travel demand from the Proposed Project development scenarios are presented in detail in a Travel Demand Memorandum, which is summarized here.[31] The forecasts are based on methodology in the *SF Guidelines* and supplemented with information that accounts for the large-scale and mixed-use qualities of the

[31] Adavant Consulting, *Pier 70 Special Use District Project – Estimation of Project Travel Demand*, September 4, 2015 (hereinafter "Travel Demand Memorandum").

Proposed Project. No "discount" was taken for trips associated with existing uses on the project site; therefore, the resulting travel demand for the Proposed Project scenarios is conservative.

Trip Generation

The first step in calculating travel demand is to determine the person-trip generation rate. Internal capture rates and mode splits are then applied to the person-trip generation rate.

The person-trip generation estimates for the two project scenarios include residents, employees, and visitors to the proposed development. The weekday daily and p.m. peak hour person-trip generation for the proposed uses at Pier 70 are based on the appropriate rates in Table C-1 in the *SF Guidelines*, except for person-trip generation by the Open Space, which was calculated based on trip rates contained in *Trip Generation*, published by the Institute of Transportation Engineers (ITE).[32] Trip generation has also been estimated for the weekday a.m. peak hour based on trip generation rates for the a.m. peak hour developed for this study using information obtained from ITE. The Proposed Project includes open space elements that would likely have special events ranging from a few hundred people a few times per month and up to approximately 5,000 people approximately four times per year. Because these events would be relatively infrequent and unlikely to occur during the typical weekday peak hours, they are not included in the travel demand calculations. However, the standard TDM measures that are part of the Proposed Project's TDM Plan would remain in place during events, and would serve to reduce the severity of effects on area transportation. Additionally, as noted above, events would require permits from the Port, and in some cases, the City. As part of the permitting process, the event sponsor must include a plan for managing travel to and from the event safely and with minimal effect to the surrounding neighborhoods. These management strategies may include special event shuttles, promotion of transit services, and parking management, such as valet parking.

Table 4.E.12: Person-Trip Generation (Internal and External Trips) presents the weekday daily, a.m. peak hour, and p.m. peak hour person-trip generation forecasts for the Proposed Project scenarios. The table presents trips that would occur within the project site (internal trips) and person-trips that would begin or end outside of the project site (external trips).

The Maximum Residential Scenario would generate 131,359 total daily person-trips on a typical weekday, 10,605 person-trips in the weekday a.m. peak hour, and 15,869 person-trips during the weekday p.m. peak hour (including both internal trips to the project site and external trips to or from locations outside of the project site). Of the total daily person-trips, 114,863 trips are attributable to the 28-Acre Site and 16,496 trips are attributable to the Illinois Parcels.

[32] Institute of Transportation Engineers, *Trip Generation*, 9th Edition, 2012.

Table 4.E.12: Person-Trip Generation (Internal and External Trips)

Land Use	Maximum Residential Scenario				Maximum Commercial Scenario			
	Size	Daily	A.M. Peak Hour	P.M. Peak Hour	Size	Daily	A.M. Peak Hour	P.M. Peak Hour
Residential (studio/1 bedroom)	1,000 units	7,500	1,067	1,298	545 units	4,088	582	707
Residential (2+ bedrooms)	2,025 units	20,250	2,882	3,503	1,100 units	11,000	1,565	1,903
Office	1,102,250 gsf	19,951	1,775	1,696	2,262,350 gsf	40,949	3,644	3,481
Light industrial and arts	143,110 gsf	2,590	231	220	143,110 gsf	2,590	231	220
General retail	269,495 gsf	40,424	941	3,638	275,075 gsf	41,261	961	3,714
Restaurant	67,375 gsf	40,425	3,657	5,457	68,765 gsf	41,259	3,733	5,570
Open Space	9 acres	219	51	57	9 acres	219	51	57
Total (internal + external trips)		**131,359**	**10,605**	**15,869**		**141,366**	**10,767**	**15,651**
Total from 28-Acre Site		114,863	8,977	13,531		121,077	9,047	13,185
Total from Illinois Parcels		16,496	1,628	2,338		20,289	1,720	2,466

Note:
Numbers may not sum to total due to rounding.

Source: Fehr & Peers, 2016; Adavant Consulting, 2015

The Maximum Commercial Scenario would generate 141,366 total daily person-trips on a typical weekday, 10,767 person-trips in the weekday a.m. peak hour, and 15,651 person-trips during the weekday p.m. peak hour (including both internal and external trips). The total daily person-trips are 121,077 trips from the 28-Acre Site and 20,289 trips from the Illinois Parcels.

The *SF Guidelines* do not provide a specific methodology to assess the number of trips that could remain within a large, mixed-use project site and would, therefore, be "double counted" with a literal application of the *SF Guidelines* trip generation methodology. Using sources including the National Cooperative Highway Research Program[33] and ITE[34] as an initial point of analysis and through an iterative process, appropriate internal trip capture rates were identified.

Similarly, the *SF Guidelines* do not provide for a methodology for estimating the number of "linked" trips, which are those trips that are made as intermediate stops on the way from an origin to a primary destination. Therefore, appropriate refinements to the standard travel demand analysis approach were made to account for the size and land use mix of the two Proposed Project scenarios, with their large proposed mixes of residential, retail, and office uses.

Table 4.E.13: Trip Generation Accounting for Internal Trips presents the weekday daily, a.m. peak hour, and p.m. peak hour internal and external person-trip generation forecasts for the Proposed Project. Internalization is dependent on the quantity and mix of uses, as well as the varying levels of activity they generate at various times of the day; as a result, the internalization percentage is different for each scenario and the peak periods. The Maximum Residential Scenario is estimated to generate a larger proportion and larger numbers of internal trips than would the Maximum Commercial Scenario on a daily basis and in the a.m. and p.m. peak hours. The internalization ratios selected were within the range of published observed internalization for various land uses published by the National Cooperative Highway Research Program and ITE, and are described more fully in the Travel Demand Memorandum.[35]

In the Maximum Residential Scenario, the Proposed Project would generate 107,059 external person-trips on a typical weekday, 8,809 external person-trips in the weekday a.m. peak hour, and 12,227 external person-trips during the weekday p.m. peak hour). Approximately 18.5 percent of daily person-trips are forecast to remain within the project site in the Maximum Residential Scenario.

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[33] Transportation Research Board, *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*, National Cooperative Highway Research Program Report 684, 2011.

[34] "Improved Estimation of Internal Trip Capture for Mixed-Use Development," ITE Journal, August 2010; and "Alternative Approaches to Estimating Internal Traffic Capture of Mixed-Use Project," ITE Journal, November 2011.

[35] Adavant Consulting, Travel Demand Memorandum.

Table 4.E.13: Trip Generation Accounting for Internal Trips

Scenario	Number and Proportion of Person-Trips[1]					
	Daily		A.M. Peak Hour		P.M. Peak Hour	
Maximum Residential Scenario						
Internal	24,300	18.5%	1,796	16.9%	3,643	23.0%
External	107,059	81.5%	8,809	83.1%	12,227	77.0%
Total	**131,359**	**100.0%**	**10,605**	**100.0%**	**15,870**	**100.0%**
Maximum Commercial Scenario						
Internal	14,099	10.0%	1,046	9.7%	2,844	18.2%
External	127,266	90.0%	9,721	90.3%	12,808	81.8%
Total	**141,365**	**100.0%**	**10,767**	**100.0%**	**15,652**	**100.0%**

Note:

[1] Numbers may not sum to total due to rounding

Sources: Fehr & Peers, 2016; Adavant Consulting, 2015

In the Maximum Commercial Scenario, the Proposed Project would generate 127,266 external person-trips on a typical weekday, 9,721 external person-trips in the weekday a.m. peak hour, and 12,808 external person-trips during the weekday p.m. peak hour. Approximately 10 percent of daily person-trips are forecast to remain within the project site in the Maximum Commercial Scenario.

As shown in Table 4.E.13, the Maximum Commercial Scenario would generate 20,207 (19 percent) more daily external person-trips than the Maximum Residential Scenario, 912 (10 percent) more external person-trips during the a.m. peak hour, and 581 (5 percent) more external person-trips during the p.m. peak hour.

Trip Distribution

The geographic distribution of project-generated residential trips was obtained from the *2009-2013 American Community Survey 5-Year Estimate for Census Tract 226*, which corresponds to the project site area, supplemented with information from the 1990 and 2000 U.S. Census. Trip distribution for office/PDR, restaurant, and retail uses was obtained from the *SF Guidelines* for land uses within Superdistrict 3 where the project site is located. Distributions are based on the origin/destination of the trip, and are separated into the four quadrants of San Francisco (Superdistricts 1 through 4), and the East Bay, North Bay, South Bay, and outside the region.

As shown in Table 4.E.14: Trip Distribution, the majority of the project-generated trips would be within San Francisco, with the greatest proportion of residential trips related to Superdistrict 1,

the northeast quadrant, and the greatest proportion of worker trips related to Superdistrict 3, the southeast quadrant. Worker trips to/from locations outside of San Francisco are nearly evenly divided between the East Bay and the Peninsula/South Bay. Visitor trips to/from the commercial uses would also be primarily within San Francisco, with the largest proportion traveling within Superdistrict 3. A substantial number of visitor trips from outside San Francisco would be to/from outside the region (12 percent of office/PDR/restaurant trips and 22 percent of retail trips). These patterns were used as the basis for assigning project-generated transit trips to individual transit lines for both project scenarios.

Table 4.E.14: Trip Distribution

Place of Trip End	Residential Trips[1]	Office/PDR/Restaurant Trips		Retail Trips	
		Workers[2]	Visitors[3]	Workers[2]	Visitors[4]
San Francisco	76.3%	53.2%	67.0%	53.2%	59.0%
Superdistrict 1 (Northeast Quadrant)	*53.4%*	*10.6%*	*17.5%*	*10.6%*	*12.5%*
Superdistrict 2 (Northwest Quadrant)	*3.8%*	*12.5%*	*14.0%*	*12.5%*	*8.0%*
Superdistrict 3 (Southeast Quadrant)	*15.3%*	*20.5%*	*28.5%*	*20.5%*	*34.5%*
Superdistrict 4 (Southwest Quadrant)	*3.8%*	*9.6%*	*7.0%*	*9.6%*	*4.0%*
East Bay	6.5%	18.4%	10.0%	18.4%	7.0%
North Bay	1.9%	5.9%	3.0%	5.9%	3.5%
South Bay	14.9%	20.6%	8.0%	20.6%	8.5%
Out of Region	0.4%	2.2%	12.0%	2.2%	22.0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

[1] *2009-2013 American Community Survey 5-Year Estimate, Census* Tract 226, supplemented with information from the 1990 and 2000 U.S. Census (see summary in Appendix H).

[2] Adavant Consulting, Memorandum to San Francisco Planning Department, "Pier 70 Special Use District Project Estimation of Project Travel Demand," September 4, 2015, Appendix D in *Pier 70 Mixed-Use District Project Transportation Impact Study*, Fehr & Peers, December, 2016.

Source: Fehr & Peers, 2016; Adavant Consulting, 2015

Transit trips were assigned to specific routes based on the most direct transit route to and from the beginning and end of the trip. Trip assignments were made separately for the Maximum Residential Scenario and the Maximum Commercial Scenario.

Travel Modes

The project-generated person-trips were assigned to travel modes in order to determine the number of auto, transit, and "other" trips. The "auto" category includes those arriving at the site by private automobile and carpool, while the "transit" category includes those arriving to the site by means of public transportation. "Other" includes walking, bicycle, motorcycle, taxi, and additional modes.

Mode split information for the residential portion of each project scenario was based on data obtained from the U.S. Census, using data from Census Tract 226, in which the project site is located. Mode of travel assumptions for the office, retail, and restaurant uses were obtained from the *SF Guidelines* for employee and visitor trips using an average of Superdistrict 1 and Superdistrict 3. Adjustments were made to account for internal trips.

Table 4.E.15: Daily, A.M. Peak Hour, and P.M. Peak Hour Trip Generation by Mode for Maximum Residential Scenario, and Table 4.E.16: Daily, A.M. Peak Hour, and P.M. Peak Hour Trip Generation by Mode for Maximum Commercial Scenario, summarize the typical weekday daily, a.m. peak hour, and p.m. peak hour external trip generation by mode of travel for the Maximum Residential Scenario and the Maximum Commercial Scenario. Each table also shows the breakdown of travel between the 28-Acre Site and the Illinois Parcels for each scenario. The person-trips shown in the "Auto" columns reflect the total number of persons travelling by

Table 4.E.15: Daily, A.M. Peak Hour, and P.M. Peak Hour Trip Generation by Mode for Maximum Residential Scenario

Land Use	Person-Trips			
	Auto	**Transit**	**Other**	**Total**
Maximum Residential – Daily				
Residential (studio/1 bedroom)	2,444	1,859	573	4,875
Residential (2+ bedrooms)	6,599	5,018	1,546	13,163
Office	8,749	4,680	3,628	17,058
Light industrial and arts	1,136	608	471	2,215
General retail	17,527	5,129	12,109	34,765
Restaurant	17,527	5,130	12,109	34,766
Open Space	128	0	91	219
Total	***54,110 (50.5%)***	***22,423 (21.0%)***	***30,526 (28.5%)***	***107,059 (100.0%)***
28-Acre Site	47,821	19,347	27,390	94,558
Illinois Parcels	6,289	3,076	3,136	12,501

Table 4.E.15 Continued

Land Use	Person-Trips			
	Auto	**Transit**	**Other**	**Total**
Maximum Residential – A.M. Peak Hour				
Residential (studio/1 bedroom)	428	340	107	875
Residential (2+ bedrooms)	1,157	917	289	2,363
Office	876	541	181	799
Light industrial and arts	114	70	24	207
General retail	411	239	66	715
Restaurant	1,549	558	892	2,999
Open Space	30	0	21	51
Total	***4,564 (51.8%)***	***2,665 (30.3%)***	***1,579 (17.9%)***	***8,809 (100.0%)***
28-Acre Site	3,898	2,216	1,365	7,479
Illinois Parcels	666	449	215	1,330
Maximum Residential – P.M. Peak Hour				
Residential (studio/1 bedroom)	452	348	108	908
Residential (2+ bedrooms)	1,219	941	292	2,452
Office	767	462	127	1,357
Light industrial and arts	100	60	17	176
General retail	1,472	432	1,006	2,911
Restaurant	2,208	649	1,509	4,366
Open Space	33	0	24	57
Total	***6,251 (51.1%)***	***2,893 (23.7%)***	***3,083 (25.2%)***	***12,227 (100.0%)***
28-Acre Site	5,383	2,405	2,707	10,495
Illinois Parcels	868	487	376	1,732

Note:
Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2015

Table 4.E.16: Daily, A.M. Peak Hour, and P.M. Peak Hour Trip Generation by Mode for Maximum Commercial Scenario

Land Use	Person-Trips			
	Auto	Transit	Other	Total
Maximum Commercial – Daily				
Residential (studio/1 bedroom)	1,277	962	295	2,534
Residential (2+ bedrooms)	3,438	2,589	793	6,820
Office	19,392	10,606	8,904	38,901
Light industrial and arts	1,227	671	563	2,461
General retail	19,084	5,568	13,309	37,960
Restaurant	19,282	5,623	13,466	38,371
Open Space	128	0	91	219
Total	***63,827 (50.1%)***	***26,018 (20.5%)***	***37,421 (29.4%)***	***127,266 (100.0%)***
28-Acre Site	55,119	22,236	32,561	110,186
Illinois Parcels	8,708	3,782	4,860	17,350
Maximum Commercial – A.M. Peak Hour				
Residential (studio/1 bedroom)	228	180	57	465
Residential (2+ bedrooms)	614	485	153	1,252
Office	1,873	1,167	422	3,462
Light industrial and arts	118	74	27	219
General retail	483	287	104	874
Restaurant	1,741	623	1,033	3,397
Open Space	30	0	21	51
Total	***5,087 (52.3%)***	***2,818 (29.0%)***	***1,816 (18.7%)***	***9,721 (100.0%)***
28-Acre Site	4,315	2,353	1,551	8,219
Illinois Parcels	772	465	265	1,502

Table 4.E.16 Continued

Land Use	Person-Trips			
	Auto	**Transit**	**Other**	**Total**
Maximum Commercial – P.M. Peak Hour				
Residential (studio/1 bedroom)	199	146	44	389
Residential (2+ bedrooms)	536	393	118	1,047
Office	1,646	1,004	308	2,959
Light industrial and arts	104	64	19	187
General retail	1,646	481	1,141	3,268
Restaurant	2,469	722	1,711	4,902
Open Space	33	0	24	57
Total	***6,632 (51.8%)***	***2,809 (21.9%)***	***3,367 (26.3%)***	***12,809 (100.0%)***
28-Acre Site	5,668	2,365	2,901	10,934
Illinois Parcels	964	444	466	1,874

Note:
Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2015

automobile, not the total number of vehicle trips, as some vehicles would transport more than one person, each of whom is making a person-trip. Vehicle trip calculations are presented below.

Under the Maximum Residential Scenario during the weekday a.m. peak hour, the Proposed Project would generate 4,564 external person-trips by automobile (52 percent), 2,665 person-trips by transit (30 percent), and 1,579 person-trips by other modes, including walking (18 percent). During the weekday p.m. peak hour, the Maximum Residential Scenario would generate 6,251 external person-trips by automobile (51 percent), 2,893 person-trips by transit (24 percent), and 3,083 person-trips by other modes (25 percent). Overall, the Maximum Residential Scenario would generate 39 percent more external person-trips in the p.m. peak hour than in the a.m. peak hour, driven by the higher trip generation rate for retail and restaurant uses during the weekday p.m. peak hour.

Under the Maximum Commercial Scenario during the weekday a.m. peak hour, the Proposed Project would generate 5,087 external person-trips by automobile (52 percent), 2,818 person-trips by transit (29 percent), and 1,816 person-trips by other modes, including walking (19 percent). During the weekday p.m. peak hour, the Maximum Commercial Scenario would generate approximately 6,632 external person-trips by automobile (52 percent), 2,809 person-trips by

transit (22 percent), and 3,367 person-trips by other modes (26 percent). Overall, the Maximum Commercial Scenario would generate 32 percent more external person-trips in the p.m. peak hour than in the a.m. peak hour, driven by the higher trip generation rate for retail and restaurant uses during the weekday p.m. peak hour, as for the Maximum Residential Scenario.

As shown in Tables 4.E.15 and 4.E.16, the overall modal split for the two scenarios of the Pier 70 Mixed-Use District Project during the a.m. and p.m. peak hours would be relatively similar. As a percentage of the total, person-trips under the Maximum Residential Scenario would be approximately 1 to 2 percent more likely to travel by transit in the peak hours compared to the Maximum Commercial Scenario. Also, as shown in Tables 4.E.15 and 4.E.16, the overall daily transit use for the two scenarios would be very similar, at about 21 percent of total person-trips.

Average vehicle occupancies were applied to the auto person-trip data presented in Tables 4.E.15 and 4.E.16 to obtain vehicle trip estimates for the project scenarios. Average vehicle occupancy rates for the land uses in the project scenarios were obtained from the U.S. Census Bureau[36] for the census tract in which the project site is located, and from the *SF Guidelines* for land uses located within Superdistrict 1 and Superdistrict 3. The external vehicle trip generation results for the daily a.m. peak hour and p.m. peak hour are summarized in Table 4.E.17: Vehicle Trip Generation (External Trips).

The Maximum Residential Scenario would generate 31,016 external daily vehicle trips on a typical weekday, 3,254 external vehicle trips (60 percent inbound / 40 percent outbound) during the a.m. peak hour, and 3,930 external vehicle trips (48 percent inbound / 52 percent outbound) during the p.m. peak hour. The 28-Acre Site would generate the majority of the vehicle trips, with approximately 26,865 daily vehicle trips, 2,726 a.m. peak hour vehicle trips, and 3,309 p.m. peak hour vehicle trips. The Illinois Parcels would generate approximately 4,151 daily vehicle trips, 528 a.m. peak hour vehicle trips, and 621 p.m. peak hour vehicle trips.

The Maximum Commercial Scenario would generate 34,790 external daily vehicle trips on a weekday, 3,438 external vehicle trips (73 percent inbound / 27 percent outbound) during the a.m. peak hour, and 3,924 external vehicle trips (37 percent inbound / 63 percent outbound) during the p.m. peak hour. Similar to the Maximum Residential Scenario, the 28-Acre Site would generate the majority of the vehicle trips under the Maximum Commercial Scenario, with approximately 29,734 daily vehicle trips, 2,884 a.m. peak hour vehicle trips, and 3,317 p.m. peak hour vehicle trips. The Illinois Parcels would generate approximately 5,056 daily vehicle trips, 554 a.m. peak hour vehicle trips, and 607 p.m. peak hour vehicle trips.

[36] U.S. 2009-2013 American Community Survey 5-Year Estimates. Vehicle occupancy data were obtained from Census Tract 226, which corresponds to the area that includes the project site.

Table 4.E.17: Vehicle Trip Generation

Land Use	Vehicle Trips		
	Daily	**A.M. Peak Hour**	**P.M. Peak Hour**
Maximum Residential Scenario			
Residential (studio/1 bedroom)	2,179	382	403
Residential (2+ bedrooms)	5,883	1,031	1,087
Office	4,871	602	525
Light industrial and arts	632	78	68
General retail	8,664	285	726
Restaurant	8,664	835	1,089
Open Space	122	41	32
Total	***31,016***	***3,254***	***3,930***
Inbound	15,508 (50%)	1,951 (60%)	1,883 (48%)
Outbound	15,508 (50%)	1,303 (40%)	2,047 (52%)
28-Acre Site	26,865	2,726	3,309
Illinois Parcels	4,151	528	621
Maximum Commercial Scenario			
Residential (studio/1 bedroom)	1,139	204	177
Residential (2+ bedrooms)	3,065	548	478
Office	10,775	1,290	1,130
Light industrial and arts	682	82	71
General retail	9,453	337	814
Restaurant	9,554	938	1,221
Open Space	122	41	32
Total	***34,790***	***3,438***	***3,924***
Inbound	17,395 (50%)	2,506 (73%)	1,459 (37%)
Outbound	17,395 (50%)	933 (27%)	2,465 (63%)
28-Acre Site	29,734	2,884	3,317
Illinois Parcels	5,056	554	607

Note:
Numbers may not sum to total due to rounding.

Source: Fehr & Peers, 2016; Adavant Consulting, 2015

The Maximum Commercial Scenario would generate approximately 3,774 (13 percent) more daily external vehicle trips than would the Maximum Residential Scenario, 184 (6 percent) more external vehicle trips during the a.m. peak hour, and 6 fewer external vehicle trips during the p.m. peak hour.

Freight Delivery and Service Vehicle Demand

The delivery/service vehicle demand forecasts for the Proposed Project scenarios use the methodology and truck trip generation rates presented in the *SF Guidelines*. Delivery/service vehicle demand is based on the types and amount of land uses. As shown in Table 4.E.18: Delivery/Service Vehicle Trips and Loading Demand, the Maximum Residential Scenario would generate approximately 642 daily delivery/service vehicle trips consisting primarily of small trucks and vans. This would correspond to a demand for 30 loading spaces during an average hour of loading activities and 37 loading spaces during the peak hour of loading activities.

Table 4.E.18: Delivery/Service Vehicle Trips and Loading Demand

Land Use	Size	Daily Truck Trip Generation Rate[1]	Daily Truck Trip Generation	Average Hour Loading Space Demand	Peak Hour Loading Space Demand
Maximum Residential Scenario					
Residential	3,025 units	0.03	79	4	5
Office/PDR	1,102,250 gsf	0.21	262	12	13
Retail	269,495 gsf	0.22	59	3	3
Restaurant	67,375 gsf	3.60	243	11	14
Total	**-**	**-**	**642**	**30**	**37**
Maximum Commercial Scenario					
Residential	1,645 units	0.03	43	2	2
Office/PDR	2,262,350 gsf	0.21	505	23	29
Retail	275,075 gsf	0.22	61	3	4
Restaurant	68,765 gsf	3.60	248	11	14
Total	**-**	**-**	**856**	**40**	**50**

Notes:
Numbers may not sum to total due to rounding.
[1] *SF Guidelines*, Table H-1.

Sources: SF Guidelines, 2002; Fehr & Peers, 2016; Adavant Consulting, 2015

The Maximum Commercial Scenario would create a greater number of daily truck trips and a greater demand for loading spaces. This scenario would generate approximately 856 daily

truck/service vehicle trips, corresponding to a demand for 40 loading spaces during an average hour and 50 loading spaces during the peak hour of loading demand.

Future 2040 Cumulative Transportation Methodology

Cumulative SB 743 / VMT Methodology

OPR's proposed transportation impact guidelines do not specify a separate methodology for analyzing cumulative impacts using a VMT metric. Under CEQA, a project is considered to have "cumulatively considerable" impacts if the incremental effects of the individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (CEQA Guidelines Section 15065(a)(3)).

VMT by its very nature is largely a cumulative impact. In general, no single project by itself would be sufficient in size to prevent the region or state from meeting its VMT (and GHG) reduction goals. Rather, an individual project's VMT contributes cumulatively to the physical secondary environmental impacts associated with the VMT resulting from the distance that existing, currently proposed and future projects would be expected to cause people to drive. VMT (and induced automobile travel) project-level significance thresholds are based on whether project VMT levels would be consistent with state and regional long-term greenhouse gas emission reduction targets and corresponding VMT per capita reduction targets.

The Planning Department has determined that a project's incremental VMT effects are not cumulatively considerable if the project site is located in an area where per capita VMT is more than 15 percent below the projected 2040 per capita regional averages for residential, office, and retail uses. This is an appropriate metric to assess cumulative VMT impacts, for the reasons set forth below.

As noted above, the Transportation Authority uses SF-CHAMP to estimate VMT for different land use types within individual TAZs. For the cumulative scenario, San Francisco 2040 cumulative VMT conditions, including cumulative VMT conditions for the TAZ in which the Project is located, were projected using a SF-CHAMP model run. This model run used the same methodology as outlined for existing conditions, but included forecasts of residential and job growth estimates and reasonably foreseeable transportation investments through 2040, based on the Association of Bay Area Governments (ABAG) most recent Projections (with projected citywide growth in population and employment allocated to individual TAZs by the Planning Department).

As stated above, OPR's proposed use of a VMT metric is intended to implement SB 743's mandate to establish criteria for determining the significance of projects' transportation impacts

that promote the "reduction of greenhouse gas emissions." Notably, San Francisco has been shown to have a significantly lower per-household carbon footprint than most other cities and counties in the San Francisco Bay Area region. Specifically, a December 2015 greenhouse gas consumption study published by the University of California, Berkeley, and funded by BAAQMD,[37] concluded that the average San Francisco household produces 38.7 metric tons of carbon dioxide equivalents (CO2e) annually, which is 12.7percent lower than the overall San Francisco Bay Area average household emissions of 44.3 metric tons of CO2e.

Maintaining per capita VMT that is 15 percent or more below the regional average is an essential component of the City's aggressive GHG reduction targets, detailed in Section H, Greenhouse Gas Emissions. Specifically, Ordinance No. 81-08, adopted in May 2008, established targets including: reduce GHG emissions by 25 percent below 1990 levels by 2017; reduce GHG emissions by 40 percent below 1990 levels by 2025; and reduce GHG emissions by 80 percent below 1990 levels by 2050 (which targets are consistent with – and in fact more ambitious than – those set forth in Governor Brown's recent EO B-30-15 by targeting a 40 percent reduction by 2025 rather than a 40 percent reduction by 2030).

Similarly, reducing per capita VMT is also a key component of the City's local GHG reduction plan, *Strategies to Address Greenhouse Gas Emissions*, recognized by BAAQMD as meeting the criteria of a qualified GHG Reduction Strategy. As further described in Section H, Greenhouse Gas Emissions), the City's Greenhouse Gas Reduction Strategy includes 30 specific regulations for new development that would reduce a project's GHG emissions. In fact, GHG reduction actions in San Francisco have resulted in a 23.3 percent reduction in GHG emissions in 2012 compared to 1990 levels, exceeding the year 2020 reduction goals in the BAAQMD's *Bay Area 2010 Clean Air Plan*, EOs S-3-05 and B-30-15, and AB 32. By complying with and exceeding Plan Bay Area targets, San Francisco is on a trajectory to meet the GHG reduction goals established by AB 32 and SB 375.

The Planning Department's cumulative significance threshold of 15 percent below 2040 per capita regional average VMT, and the proposed Project's VMT per capita, which is well below that threshold, are consistent with the adopted sustainability targets of the *Plan Bay Area*. The current *Plan Bay Area*, adopted on July 18, 2013 (Plan Bay Area 2013), is the region's Sustainable Communities Strategy for the San Francisco Bay Area 2013-2040. The current

[37] C. Jones, D. Kammen (2015). A Consumption-Based Greenhouse Gas Inventory of San Francisco Bay Area Neighborhoods, Cities and Counties: Prioritizing Climate Action for Different Locations. University of California, Berkeley, and Bay Area Air Quality Management District. Available online at http://www.baaqmd.gov/research-and-data/emission-inventory/consumption-based-ghg-emissions-inventory (last accessed 9/30/16).

update that began in Spring 2015 is called Plan Bay Area 2040, with release of the Draft Plan Bay Area 2040 and associated Draft EIR anticipated in March 2017.

Plan Bay Area 2013 is designed to reach greenhouse gas reductions established by CARB for the Bay Area region, which targets include a 7 percent per capita reduction by 2020 and a 15 percent per capita reduction by 2035.[38] Plan Bay Area 2013 identified 10 performance targets, which include both mandatory and voluntary targets. One of the mandatory performance targets requires the Bay Area to reduce its per-capita CO_2 emissions from cars and light duty trucks by 15 percent by 2040. Plan Bay Area achieves this milestone.[39] One of the voluntary targets includes decreasing automobile VMT per capita by 10 percent.[40] Plan Bay Area 2013 states that the average Bay Area resident traveled about 22 miles by car on a typical weekday in 2005; by 2040, the average resident is expected to travel 20 miles per day, a reduction of 9 percent. This near-achievement of the per-capita VMT target reflects the carefully targeted locations of envisioned housing and commercial development in Priority Development Areas with excellent transit service.[41] Even though Plan Bay Area achieves VMT reductions of 9 percent, which does not fully achieve the adopted 10 percent reduction target, Plan Bay Area nonetheless achieves the mandatory performance target to reduce per-capita CO_2 emissions from cars and light duty trucks by 15 percent by 2040[42].

Notably, the type of growth planned within the Port of San Francisco Priority Development Area (PDA), and growth within the City and County of San Francisco as a whole, will necessarily result in a population-based increased volume of VMT and GHG emissions, regardless of the City's GHG reduction targets and any new GHG reduction measures. Similarly, the population and economic activity associated with each project within the Port of San Francisco PDA, and within the City and County of San Francisco, will result in a total increase of VMT and GHG emissions. Certain projects may meet or exceed estimated population and/or employment growth identified for the Port of San Francisco PDA, while remaining within ABAG projections for the 2040 cumulative scenario. Notwithstanding such increased volume of GHG emissions and VMT, San Francisco complies with and exceeds Plan Bay Area GHG reduction targets, and is on a trajectory to meet the GHG reduction goals established by AB 32 and SB 375. Accordingly, consistency with *Plan Bay Area*, a plan designed to reach greenhouse gas reductions established by CARB for the Bay Area region, provides further support for the Planning Department's

[38] Association of Bay Area Governments and Metropolitan Transportation Commission, *Plan Bay Area*, July 18, 2013 (hereinafter "Plan Bay Area 2013," p. 4.
[39] Plan Bay Area 2013, p. 5.
[40] Ibid., p. 106.
[41] Ibid.
[42] Ibid., p. 5

adopted significance threshold for determining whether a project's incremental VMT effects are cumulatively considerable.

Future 2040 Transportation Network Improvements

There are several reasonably foreseeable improvements planned on the transportation network in the transportation study area. For the purposes of the transportation analysis for this EIR, the following transit improvements from Muni Forward were assumed to be in place as part of the 2040 cumulative conditions, in addition to those assumed to be in place for the Baseline Conditions:

- On the T Third light rail line, peak period headways would be reduced and trains would operate as two-car trains.[43]
- The 10 Townsend route would be rerouted off Townsend Street at Fourth Street. From Fourth Street, the route would extend through Mission Bay to new proposed street segments on Seventh Street between Mission Bay Boulevard and Hubble Street, on Hubble Street between Seventh and 16th streets, on 16th Street between Hubble and Connecticut streets, and on Connecticut Street between 16th and 17th streets. Peak period headways would be reduced from 20 to 6 minutes. Midday headways would be reduced from 20 to 12 minutes. The 10 Townsend would be renamed the 10 Sansome.
- The 48 Quintara/24th Street would operate all day from 48th Avenue to the Hunters Point Naval Shipyard. At 25th and Connecticut streets, this route would no longer follow the existing alignment and would change to follow the existing 19 Polk route to Hunters Point via Evans and Innes avenues. This would provide a new connection from the Mission District, Noe Valley, and the Sunset to Third Street and Hunters Point. The existing portion of the 48 Quintara/24th Street route east of Connecticut Street would be re-branded as the 58 as part of Muni Forward improvements.

Other transportation projects that were taken into consideration in the overall cumulative transportation analysis include the *San Francisco Bicycle Plan*, the Second Street Improvement Project, the Van Ness and Geary BRT Projects, and the Caltrain electrification program.

Future 2040 Development Projects

In addition to the transportation improvements listed above, the cumulative transportation impact analysis includes forecasted growth in jobs and employment in San Francisco by the year 2040. This growth includes, but is not limited to, the following reasonably foreseeable nearby development projects:

- Mission Bay Redevelopment Plans (the portions not yet built out)
- Candlestick Point-Hunters Point Shipyard Development Plan

[43] The assumptions for service increases as part of the Central Subway described herein are based on the Central Subway operating plan, which were developed and approved (including appropriate CEQA review) independent of and supersede assumptions for the T Third line outlined in Muni Forward.

- Development associated with nearby neighborhood plans, including the Eastern Neighborhoods Plans and the Western SOMA Plan
- Golden State Warriors Event Center and Mixed-Use Development
- Mission Rock Mixed-Use Project on Seawall Lot 337 and Pier 48
- Future Crane Cove Park
- India Basin
- Potrero Hope SF Master Plan

The cumulative transportation analysis is projection-based, rather than list-based; therefore, the projects listed here are simply examples of those that are accounted for in the growth forecast used in the travel demand forecasting model. The model includes a comprehensive projection of growth that is reasonably foreseeable in 2040, based on known and forecast development including growth under adopted area plans that could affect San Francisco's transportation network.

Cumulative Transportation Demand

Future year 2040 cumulative intersection traffic volumes were derived from outputs from the Transportation Authority's travel demand forecasting model (SF-CHAMP). The SF-CHAMP model is an activity-based travel demand model that has been validated to represent existing and future transportation conditions in San Francisco. The model predicts all person travels for a full day based on total and locations of population, housing units, and employment, which are then allocated to different periods throughout the day, using time of day sub-models. The model predicts person travel by mode for auto, transit, walk, and bicycle trips. The model also provides forecasts of vehicular traffic on regional freeways and major arterials and on the study area local roadway network, considering the available roadway capacity, origin-destination demand, and travel speeds when assigning the future travel demand to the roadway network.

Future year 2040 cumulative transit ridership projections were developed based on transit growth projections developed for the Transit Effectiveness Project and provided by the Planning Department. Forecast future hourly ridership demand was then compared to expected hourly capacity, as determined by the likely route and headway changes identified in Muni Forward, including those described above under the "Future 2010 Transportation Network Improvements" discussion, p. 4.E.74, to estimate capacity utilization under 2040 cumulative conditions.

IMPACT EVALUATION

CONSTRUCTION IMPACTS

Impact TR-1: Construction of the Proposed Project would not result in significant impacts on the transportation and circulation network because they would be of limited duration and temporary. (*Less than Significant*)

The discussion of construction impacts is based on currently available information from the project sponsors, summarized in Chapter 2, Project Description, and professional knowledge of typical construction practices in San Francisco. Build-out of the Proposed Project would occur in up to five phases over an approximately 11-year period, from about 2018 through about 2029. Infrastructure would be constructed in tandem with new and rehabilitated buildings and open space. Construction impacts would be the same for both the Maximum Residential Scenario and the Maximum Commercial Scenario.

Construction-related activities would generally occur Monday through Saturday, between 7:00 a.m. and 8:00 p.m., and the typical work shift for most construction workers would be from 7:00 a.m. to about 3:30 p.m. Construction is not anticipated to occur on Sundays or major legal holidays, but may occur on an as-needed basis. The hours of construction would be stipulated by the San Francisco Department of Building Inspection. Construction staging would occur within the project site.

The project sponsors and construction contractor(s) would be required to prepare traffic control plans for the various construction phases, which would be intended to reduce potential conflicts between construction activities and pedestrians, bicycles, transit, and autos at the project site and with other construction projects in the project vicinity that are expected to occur during the 11-year construction period. The exact routes that construction trucks would use would depend on the location of construction materials being transported to the project site and the location of the construction activities on the project site as well as the location of disposal sites for excavated soil and demolition debris. However, it is reasonable to assume that construction vehicles would typically use Third Street and 25th Street or Mariposa Street to access I-280 to travel south; Third Street and either Second or Fifth streets to reach the Bay Bridge and the East Bay; and Third Street, Howard Street, and Van Ness Avenue (U.S. 101) to travel to North Bay destinations. All of these streets have two or more travel lanes in each direction and are designed to handle truck traffic. The impact of construction traffic on these streets could be a slight lessening of their capacities due to slower-moving vehicles and would not substantially affect peak period conditions because construction work schedules do not typically coincide with the peak commute periods. Truck access routes would be reviewed with SFMTA as part of the traffic control plans.

If temporary traffic lane, parking lane, or sidewalk closures would be needed, the closures would be coordinated with City staff to minimize effects on local traffic and circulation. In general, lane and sidewalk closures are subject to review and approval by the City's Transportation Advisory Staff Committee (TASC) that consists of representatives of City departments, including SFMTA, Public Works, the Fire Department, the Police Department, the Health Department, the Port, and the Taxi Commission. There are no Muni bus stops adjacent to or on the project site, so none would need to be relocated.

The trip distribution and mode split of construction workers are speculative to estimate. However, it is anticipated that the addition of the worker-related vehicle or transit trips would not substantially affect transportation conditions, as impacts on local intersections or the transit network would be substantially less than those associated with the Proposed Project and would be temporary in nature. Construction workers who drive to the site and potential temporary parking restrictions along Illinois Street would cause a temporary increase in parking demand and a decrease in supply. Construction workers would need to park either on-street, in parking facilities that currently have availability during the day, or in temporary parking facilities established on vacant parcels. However, parking shortfalls would be temporary and are not considered a significant environmental impact.

Overall, construction-related transportation impacts of the Proposed Project would be less than significant and no mitigation measures would be required. However, the following Improvement Measure is identified to further reduce less-than-significant potential conflicts between construction activities and pedestrians, bicyclists, transit, and autos, and between construction activities and nearby businesses and residents:

Improvement Measure I-TR-A: Construction Management Plan

Traffic Control Plan for Construction – To reduce potential conflicts between construction activities and pedestrians, bicyclists, transit, and autos during construction activities, the project sponsors should require construction contractor(s) to prepare a traffic control plan for major phases of construction (e.g., demolition and grading, construction, or renovation of individual buildings). The project sponsors and their construction contractor(s) will meet with relevant City agencies to coordinate feasible measures to reduce traffic congestion, including temporary transit stop relocations and other measures to reduce potential traffic and transit disruption and pedestrian circulation effects during major phases of construction. For any work within the public right-of-way, the contractor would be required to comply with San Francisco's Regulations for Working in San Francisco Streets (i.e., the "Blue Book"), which establish rules and permit requirements so that construction activities can be done safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicular traffic. Additionally, non-construction-related truck movements and deliveries should be restricted as feasible during peak hours (generally 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to

6:00 p.m., or other times, as determined by SFMTA and the Transportation Advisory Staff Committee [TASC]).

In the event that the construction timeframes of the major phases and other development projects adjacent to the project site overlap, the project sponsors should coordinate with City Agencies through the TASC and the adjacent developers to minimize the severity of any disruption to adjacent land uses and transportation facilities from overlapping construction transportation impacts. The project sponsors, in conjunction with the adjacent developer(s), should propose a construction traffic control plan that includes measures to reduce potential construction traffic conflicts, such as coordinated material drop offs, collective worker parking, and transit to job site and other measures.

Reduce Single Occupant Vehicle Mode Share for Construction Workers – To minimize parking demand and vehicle trips associated with construction workers, the project sponsors should require the construction contractor to include in the Traffic Control Plan for Construction methods to encourage walking, bicycling, carpooling, and transit access to the project construction sites by construction workers in the coordinated plan.

Project Construction Updates for Adjacent Residents and Businesses – To minimize construction impacts on access for nearby residences, institutions, and businesses, the project sponsors should provide nearby residences and adjacent businesses with regularly-updated information regarding construction, including construction activities, peak construction vehicle activities (e.g., concrete pours), travel lane closures, and lane closures via a newsletter and/or website.

OPERATIONAL IMPACTS

VMT IMPACTS

As noted in the Analysis Methodology section, San Francisco uses maps illustrating areas that exhibit below-threshold VMT. The maps demonstrate whether a proposed project is in a transportation-efficient location, (e.g., transit-oriented infill), and will help the City, region and state reach their GHG reduction targets under AB 32. The Transportation Authority has prepared SF-CHAMP model runs to estimate the existing VMT generated per capita within each of the City's TAZs for residential, office, and retail land uses. In those TAZs where land uses are estimated to generate VMT per capita at a rate no more than 15 percent lower than the regional average for that land use type, new proposed land uses are forecasted to also generate VMT per capita at no more than 15 percent lower than the regional average for that land use type, so long as the proposed land uses are relatively similar in transportation context to the existing surrounding land uses (i.e., similar parking ratios, scale, transportation amenities, etc.).

Impact TR-2: The Proposed Project would not cause substantial additional VMT nor substantially induce automobile travel. (*Less than Significant*)

As summarized in Table 4.E.3 above, existing average daily VMT per capita is more than 15 percent below the existing regional average daily VMT per capita for residential, office, and retail uses in TAZ 559 where the Proposed Project is located. Given that the project site is located in

an area where existing VMT is more than 15 percent below the existing regional average, the Proposed Project's residential, office, and retail (and thus, PDR, open space, and restaurant) uses would not result in substantial additional VMT and impacts would be less than significant. Furthermore, the project site meets the Proximity to Transit Stations screening criterion, which also indicates that the Proposed Project's uses would not cause substantial additional VMT.[44]

For the reasons set forth below, the amount of parking included in the Proposed Project would not result in VMT beyond the significance threshold.

As stated above, many factors affect travel behavior. These factors include density, diversity of land uses, design of the transportation network, access to regional destinations, distance to high-quality transit, development scale, demographics, and transportation demand management.[45] The Transportation Authority's SF-CHAMP accounts for a variety of these factors to estimate VMT throughout San Francisco. SF-CHAMP is not sensitive to site-level characteristics like TDM measures. The amount of parking provided on a site is considered a TDM measure.

As part of the "Shift" component of the Transportation Sustainability Program, the City is pursuing the San Francisco TDM Program. The purpose of the TDM Program is to reduce the VMT that otherwise would be forecast to occur from new development (in SF-CHAMP or other transportation modeling software) based upon the new development's TAZ location. In order to achieve this VMT reduction, the San Francisco TDM Program requires that property owners select from a menu of TDM measures, defined as measures that reduce VMT by residents, tenants, employees, and visitors and are under the control of the property owner. A reduction in VMT may result from shifting vehicle trips to sustainable travel modes or reducing vehicle trips, increasing vehicle occupancy, or reducing the average vehicle trip length.

The TDM Technical Justification document[46] provides the technical basis for the creation of the applicability, targets, and assignment of points to individual measures on the TDM menu used for the San Francisco TDM Program. Each of the TDM measures on the menu is assigned a number of points, reflecting its relative effectiveness in reducing VMT. This relative effectiveness determination is grounded in literature review, local data collection, best practices research, and professional transportation expert opinion. One of the individual measures in the TDM menu that was researched was parking supply, as described below.

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[44] San Francisco Planning Department, *Transit-Oriented Infill Project Eligibility Checklist*, Pier 70 Mixed-Use Project, Case No. 2014-001272ENV, dated November 18, 2015.

[45] California Smart-Growth Trip Generation Rates Study, Appendix A, University of California, Davis Institute of Transportation Studies, March 2013.

[46] San Francisco Planning Department, *Transportation Demand Management Technical Justification*, June 2016

In 2010, the California Air Pollution Control Officers Association (CAPCOA) published a report that quantifies project-level land use, transportation, energy use, and other measures effects on GHG emissions based upon a literature review of research conducted to date.[47] The CAPCOA report identifies a maximum of 12.5 percent reduction in VMT related to parking supply (PDT-1). Recent research, described further below, indicates that an area with more parking influences a higher demand for more automobile use.

A New York City study of three boroughs showed a clear relationship between guaranteed vehicular parking at home and a greater tendency to use the automobile for trips made to and from work, even when both work and home are well served by transit. The study also infers that driving to other non-work activities is also likely to be higher for households with guaranteed vehicular parking.[48] Related literature focused on the relationship between the availability of free on-street parking supply and the number of cars per household supports the findings that the availability of parking increases private car ownership by approximately nine percent.[49] A study of households within a two-mile radius of ten rail stations in New Jersey concluded that if development near transit stations is developed with a high parking supply (on- and off-street), then those developments will not reduce automobile use compared to developments located further away from transit stations, and that parking supply can undermine the incentive to use transit that proximity to transit provides.[50] A study of nine cities across the United States looked at the question of whether citywide changes in vehicular parking cause automobile use to increase, or whether minimum parking requirements an appropriate response the already rising automobile use. The study concluded that: "parking provision in cities is a likely cause of increased driving among residents and employees in those places".[51]

Research conducted in San Francisco focused on whether or not a relationship exists between the provision of off-street parking and the choice to drive among individuals traveling to or from the site (similar to the focus of one of the questions in the nine-city United States study). Following data collection and an empirical review of the data, this research found that reductions in off-street vehicular parking for office, residential, and retail developments reduce the overall automobile mode share associated with those developments, relative to projects with the same

[47] California Air Pollution Control Officers Association (CAPCOA), *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures,* August 2010.

[48] Rachel Weinberger, "Death by a thousand curb-cuts: Evidence on the effect of minimum parking requirements on the choice to drive," *Transport Policy, 20,* March 2012.

[49] Guo Zhan, "Residential Street Parking and Car Ownership," *Journal of the American Planning Association, 79:1,* 32-48, May 9, 2013.

[50] Daniel Chatman, "Does Transit-Oriented Development Need the Transit?", Access, Fall 2015.

[51] Chris McCahill, et al., "Effects of Parking Provision on Automobile Use in Cities: Inferring Causality," Transportation Research Board, November 13, 2015.

land uses in similar contexts that provide more off-street vehicular parking.[52] In other words, more off-street vehicular parking is linked to more driving and that people without dedicated parking spaces are less likely to drive.

Based upon the recent research, a reduced parking supply is one the most effective TDM measure available in the menu for the TDM Program. Eleven options (with points associated with them) are provided for this TDM measure in the TDM Program, depending upon the development project's parking supply[53] compared to the neighborhood parking rate. The neighborhood parking rate is number of existing parking spaces provided per dwelling unit or per 1,000 square feet of non-residential uses for each TAZ within San Francisco.

Using the neighborhood parking rate as a basis for assigning points accounts for the variability in geography throughout San Francisco and the effect this can have on travel behavior. Although parking supply is not an input into SF-CHAMP, based upon the recent research, the existing parking supply within a TAZ has a relationship with the VMT for that TAZ. Therefore, a new development would mostly likely not reduce VMT as it relates to parking supply if the new development is not parked at least at or below the neighborhood parking rate.

In this instance, the existing neighborhood parking rate for the project site (TAZ 559) is 0.72 spaces per residential unit and 0.04 per 1,000 square feet of non-residential space. The parking rate takes into account the amount of parking and residential units and non-residential square footage in the TAZ itself and other nearby accessible TAZs within a 0.75 mile network-based walking distance, with more distant parking and residential units and non-residential square footage within that walking distance given decreasing weight. Therefore, although the project site is relatively underutilized and only contains non-residential uses, the neighborhood parking rate accounts for residential units and non-residential square footage nearby. These rates, and in particular, the rate for non-residential space are substantially lower than elsewhere in the City, likely due to the prevalence of large industrial warehousing spaces in the neighborhood that tend to have large square footages with relatively low travel activity, and thus require low amounts of off-street parking, particularly when on-street parking exists.

In addition, even though parking is not specifically an input into SF-CHAMP, the existing parking is captured in the estimates of VMT outputs from SF-CHAMP because it is an existing condition on the ground. As mentioned above, existing average daily VMT per capita, per employee, and per retail employee in TAZ 559 is below the existing regional average daily VMT per capita, per employee, and per retail employee, respectively. Therefore, in order to exceed the

[52] Fehr and Peers, *Parking Analysis and Methodology Memo – Final*, April 2015.
[53] This refers to accessory (or off-street) parking supply, which is defined in the TDM Program Standards.

threshold of 15 percent below regional averages, the project would have to substantially increase VMT per capita, per employee, and per retail employee.

In typical conditions, a proposed project would be relatively similar in land use mix to the surrounding neighborhood's land uses. Under these circumstances, in order to account for an increase or decrease in VMT per capita from the project's parking supply, the project's parking rate is compared to the neighborhood parking rate.

The Proposed Project includes up to 3,496 parking spaces. Maximum parking supply rates per land use are 0.75 spaces per residential unit and 1.0 spaces per 1,000 square feet for non-residential uses. The residential parking rate is slightly higher than the neighborhood average rate; however, it is very close to the neighborhood average, and to the extent such a small difference may affect VMT, it is not likely to increase VMT to the point where it would exceed the threshold since the residential VMT per capita is expected to be 49 percent below the regional average.

The Proposed Project's parking supply rates for non-residential uses are higher than the neighborhood average, which could indicate that the Proposed Project's non-residential uses may be expected to generate higher VMT rates than the forecasts from SF-CHAMP (which are designed to project the "average" project) would otherwise suggest. However, the overall premise of the above discussion of parking is that for similar land uses, with all other factors held constant, an increase in parking supply would tend to increase VMT per capita and a decrease in parking supply would tend to decrease VMT per capita. In the case of the Proposed Project, the existing neighborhood non-residential parking supply, expressed as a rate per 1,000 square feet of development, is highly influenced by the prevalence of large industrial warehouses which have large square footages and relatively little transportation activity per square foot. In contrast, the Proposed Project would consist primarily of residential, retail, office, and light industrial uses, which would result in a higher population (employees and visitors) per square foot than large warehouses. Thus, the fact that the Proposed Project's non-residential parking supply rates, which are based on retail, office, and light industrial uses are higher than the existing neighborhood's non-residential parking ratio, which consists of primarily large industrial warehouses, does not necessarily suggest that the Proposed Project's land uses would generate VMT per capita for office and retail uses at a higher rate than forecasted by SF-CHAMP. In this case, because there is relatively little office and retail use in the study area comparable to the Proposed Project, a comparison to the neighborhood average is not as meaningful.

Further, as noted at the end of this Chapter, under Parking Information, pp. 4.E.124-4.E.126, for both residential and non-residential uses, the Proposed Project's parking supply is forecasted to be less than the forecasted parking demand, meaning that parking is constrained and likely contributing to decreases in VMT compared to conditions with an unconstrained parking supply.

Thus, the parking at the Proposed Project is not likely to be readily available and travelers would likely experience parking shortfalls during peak times. As a result, even though parking ratios may be higher than the neighborhood average, the effect of a parking supply that does not meet forecasted demand suggests that the VMT rates forecasted by SF-CHAMP should not be adjusted upward to account for an abundant parking supply.

Additionally, the above discussion does not fully account for the reduction in VMT likely to occur due to the Proposed Project's TDM Plan, which includes robust measures (such as shuttles, participation in the regional bikeshare program, unbundled parking supply, and the establishment of a site-wide Transportation Management Agency) to reduce VMT. The TDM Technical Justification document includes documentation regarding the estimated VMT reduction from many of the measures included in the Proposed Project's TDM Plan. Therefore, the VMT impacts of the Proposed Project would be less than significant.

Although the VMT impacts would be less than significant, implementation of the Air Quality Mitigation Measure M-AQ-1f: Transportation Demand Management, pp. 4.G.47-4.G.50, would likely further reduce the Proposed Project's less-than-significant impacts related to VMT such that it would be lower than the forecasts discussed above, if implemented. Generally, Mitigation Measure M-AQ-1f would require the reduction of single-occupant automobile trips through TDM elements that would supplement those outlined in the Proposed Project's TDM Plan. As noted earlier, the City is in the process of adopting a TDM Ordinance, requiring new development projects to implement a specific level of TDM measures. Because the Proposed Project is part of a proposed Special Use District, the Proposed Project would not be subject to the TDM Ordinance. However, the Proposed Project's TDM Plan would be required to achieve a similar policy goal to the TDM Ordinance. The Mitigation Measure described above would further enhance the level of TDM measures implemented.

Finally, the Proposed Project is not a transportation project. However, the Proposed Project would include features that would alter the transportation network. The features are new sidewalks and sidewalk widening, bicycle facilities, on-street loading zones and curb cuts, new internal roadways, on-street safety strategies, and intersection signalization described in Chapter 2, Project Description. These features fit within the general types of projects identified above that would not substantially induce automobile travel as they do not create substantial increases in roadway capacity.[54] Therefore, impacts would be less than significant.

[54] San Francisco Planning Department, Executive Summary: Resolution Modifying Transportation Impact Analysis, Appendix F, Attachment A, March 3, 2016.

TRAFFIC IMPACTS

The Proposed Project would have a significant impact on traffic if it created or contributed to a major traffic hazard in the study area. In general, the Proposed Project would add vehicle trips to the surrounding roadways; however, a general increase in traffic in and of itself would not be considered a traffic hazard.

Impact TR-3: The Proposed Project would not create major traffic hazards. (*Less than Significant*)

Existing vehicle, pedestrian, and bicycle volumes on Illinois Street, 20th Street, 22nd Street, and other streets near the project site are low (with the exception of Third Street). The Proposed Project would add vehicle trips to the surrounding roadways; however, a general increase in traffic would not be considered a traffic hazard. The Proposed Project's new internal street system is currently under development; however, the final designs would be subject to approval by the SFMTA, San Francisco Fire Department, and the Department of Public Works to ensure that the streets are designed consistent with City policies and design standards. Overall, the Proposed Project's street network has been designed to minimize street widths and provide ample sidewalk space, which serves to calm traffic, shorten pedestrian crossing distances, and encourage use of walking and bicycling.

When events are planned at the Pier 70 site, the event sponsors would be required to obtain permits from the Port of San Francisco; these permits will include strategies to enhance transportation conditions in Mission Bay and nearby neighborhoods.[55] The site's TDM coordinator should participate as a member of the Mission Bay Ballpark Transportation Coordination Committee (MBBTCC) and provide notification prior to the start of any event that would overlap with an event at the Warriors arena.

Because the Proposed Project's roadway network is designed to prioritize safe bicycle and pedestrian travel within the site, traffic speeds are likely to be relatively slow within the project site. Further, the Proposed Project would install traffic control devices within and adjacent to the project site that would further enhance safety for all users based on forecasted traffic conditions. As a result, the Proposed Project is not expected to create a major traffic hazard, and the Proposed Project's traffic impacts are considered less than significant.

[55] All new parks constructed as part of the Proposed Project would be owned by the Port of San Francisco and events would be required to go through the Port's permitting process on a case-by-case basis. For private parcels within the Proposed Project, no event venues are proposed. Generally, events with fewer than 2,000 attendees would be managed via the strategies included in the Proposed Project's TDM plan and would be expected to be operated in a manner similar to the way events on Pier 70 are currently managed. However, events with more than 2,000 attendees may require additional strategies to improve transportation conditions that would be developed through the MBBTCC.

TRANSIT IMPACTS

The Proposed Project would generate 2,665 person-trips on transit during the weekday a.m. peak hour and 2,893 person-trips on transit during the weekday p.m. peak hour in the Maximum Residential Scenario. In the Maximum Commercial Scenario, the Proposed Project would generate similar totals for transit ridership – 2,818 person-trips on transit during the weekday a.m. peak hour and 2,809 person-trips on transit during the weekday p.m. peak hour. Transit trips to and from the project site would use nearby Muni routes (T Third, 10 Townsend, 22 Fillmore, or 48 Quintara/24th Street) or the Proposed Project's shuttle system to connect to and from regional transit providers.

The Proposed Project would include a shuttle service, operated and maintained by the Pier 70 TMA, to connect the Pier 70 Mixed-Use District to regional transit hubs. The primary goal of the proposed shuttle service at Pier 70 is to provide a first-mile / last-mile connection for transit riders traveling to or from the project site, particularly for riders needing to use frequent local and regional transit. These riders would be expected to take regional transit services operated by BART, Caltrain, AC Transit, Golden Gate Transit, SamTrans, or other regional transit providers, but would need an additional connection to access these services when traveling to or from Pier 70.

The exact structure of any shuttle service provided for the Proposed Project site has not been established and would depend on factors that are not known at this time. For planning and analysis purposes, two routes have been preliminarily identified; however, final service routes and stops would be determined based on rider feedback and demand, peak period traffic congestion on local streets, and BART and Caltrain schedules and service plans at specific stations. The two preliminary routes assumed for this analysis are:

- 22nd Street, Mississippi Street, and 16th Street to access the 22nd Street Caltrain Station and the 16th Street / Mission BART station
- Third Street, 16th Street, and King Street to access the Fourth and King Caltrain Station (with some trips extending to the Transbay Transit Center)

While shuttle riders would have the option of taking local transit services operated by Muni, the shuttle system would offer complimentary service to meet the needs of these users, similar to the way in which the Mission Bay TMA shuttle system enhances existing Muni service. For the purposes of this analysis, residents and employees at the project site were forecast to use the shuttle to get to the regional transit service hubs (e.g., BART and Caltrain). All transit trips not associated with a regional service connection were assumed to be via Muni routes, rather than on the shuttle, because the shuttle is not intended to replicate Muni's local service. The proposed 15-minute headways of the shuttles would be similar to the existing 10 Townsend, 22 Fillmore, or 48

Quintara/24th Street headways. However, the shuttle service would be free to residents, employees, and other visitors.

The shuttle service would enroll in the SFMTA Commuter Shuttle Program. The Commuter Shuttle Program includes minor modifications to the existing roadways to install new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands, and bus bulbs. The shuttle would follow all policies set forth by the Commuter Shuttle Program. The Commuter Shuttle Program was environmentally cleared on October 22, 2015.[56]

The Baseline Conditions assume completion of the Central Subway, which is planned to open in 2019 and would supplement the existing Muni routes. After the service changes being implemented as part of the Muni Forward campaign, the 22 Fillmore and 33 Stanyan will provide service in the 16th Street corridor at 6- to 8-minute headways and 12-minute headways, respectively, during the peak periods. The 58 24th Street route (replacing portions of the 48 Quintara/24th Street) would be the least frequent Muni route serving Pier 70, but is still proposed for weekday headways of 15 minutes during the a.m. and p.m. peak periods and midday period. These service changes were also assumed in the Baseline Conditions analysis.

The additional project-generated transit trips would follow the geographic trip distribution patterns described earlier throughout San Francisco and the region. Transit trips were assigned to the individual transit routes based on the likely origins and destinations of the trips and the available capacity on each route. Table 4.E.19: Muni Downtown Screenlines – A.M. Peak Hour and Table 4.E.20: Muni Downtown Screenlines – P.M. Peak Hour present the ridership and capacity utilization at Muni screenlines and on individual Muni routes with project-generated transit trips added to the baseline ridership in the a.m. and p.m. peak periods.

As shown in the tables, with the addition of project-generated transit trips, some Muni transit corridors and individual routes would exceed Muni's capacity utilization standard of 85 percent, although no screenlines would exceed the standard.

Overall, two of the primary routes serving the study area (the T Third and the 22 Fillmore) would operate in dedicated rights-of-way and therefore are not likely to be affected by project-related traffic congestion. The 48 Quintara/24th Street will not operate on major streets in the vicinity of the Proposed Project and as such, its route is not likely to be affected by project-generated traffic congestion either. Thus, the Proposed Project's impacts on transit delay are expected to be minor and are not discussed in detail in this analysis.

[56] San Francisco Planning Department Case No. 2015-007975ENV, SFMTA – Commuter Shuttle Program, Certificate of Determination – Exemption from Environmental Review, October 2015.

Table 4.E.19: Muni Downtown Screenlines – A.M. Peak Hour

Muni Screenline	Baseline			Baseline Plus Project – Residential			Baseline Plus Project – Commercial		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast									
Kearny/Stockton	2,273	3,157	72%	0	2,273	72%	0	2,273	72%
Other lines	710	1,141	62%	54	764	67%	37	747	65%
Screenline Total	*2,983*	*4,298*	*69%*	*54*	*3,037*	*71%*	*37*	*3,020*	*70%*
Northwest									
Geary	2,302	3,764	61%	0	2,302	61%	0	2,302	61%
California	1,436	2,010	71%	0	1,436	71%	0	1,436	71%
Sutter/Clement	514	630	82%	0	514	82%	0	514	82%
Fulton/Hayes	1,505	2,237	67%	0	1,505	67%	0	1,505	67%
Balboa	553	1008	55%	0	553	55%	0	553	55%
Screenline Total	*6,310*	*9,649*	*65%*	*0*	*6,310*	*65%*	*0*	*6,310*	*65%*
Southeast									
Third Street	1,025	3,808	27%	215	1,240	33%	152	1,177	31%
Mission	2,155	2,632	82%	0	2,155	82%	0	2,155	82%
San Bruno/Bayshore	1,867	2,197	**85%**	0	1,867	**85%**	0	1,867	**85%**
Other lines	1,577	1,756	**90%**	81	1,658	**94%**	101	1,678	**96%**
Screenline Total	*6,624*	*10,393*	*64%*	*296*	*6,920*	*67%*	*253*	*6,877*	*66%*
Southwest									
Subway lines	6,783	7,020	**97%**	323	7,106	**101%**	410	7,193	**102%**
Haight/Noriega	1,178	1,596	74%	0	1,178	74%	0	1,178	74%
Other lines	474	560	**85%**	0	474	**85%**	0	474	**85%**
Screenline Total	*8,435*	*9,176*	***92%***	*323*	*8,758*	***95%***	*410*	*8,845*	***96%***
Muni Screenlines Total	*24,352*	*33,515*	*73%*	*673*	*25,025*	*75%*	*700*	*25,052*	*75%*

Table 4.E.19 Continued

Muni Screenline	Baseline			Baseline Plus Project – Residential			Baseline Plus Project – Commercial		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Individual Muni Routes									
22 Fillmore IB	501	882	57%	163	664	75%	129	630	71%
22 Fillmore OB	340	882	39%	245	585	66%	350	690	78%
48 Quintara / 24th Street IB	119	252	47%	149	268	**106%**	118	237	**94%**
48 Quintara / 24th Street OB	199	252	79%	224	423	**168%**	319	518	**206%**
KT Third Ingleside IB	1,097	3,808	29%	323	1,420	37%	410	1,507	40%
KT Third Ingleside OB	1,931	3,808	51%	215	2,146	56%	152	2,083	55%

Notes:
Bold indicates capacity utilization of 85 percent or greater.

Source: Fehr & Peers, 2016. See Appendix C in the Transportation Impact Study for Transit Line Capacity Calculations.

Table 4.E.20: Muni Downtown Screenlines – P.M. Peak Hour

Muni Screenline	Baseline			Baseline Plus Project – Residential			Baseline Plus Project – Commercial		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast									
Kearny/Stockton	2,444	3,327	73%	0	2,444	73%	0	2,444	73%
Other lines	903	1,155	78%	71	974	84%	51	954	83%
Screenline Total	*3,347*	*4,482*	*75%*	*71*	*3,418*	*76%*	*51*	*3,398*	*76%*
Northwest									
Geary	2,913	3,621	80%	0	2,913	80%	0	2,913	80%
California	1,349	1,752	77%	0	1,349	77%	0	1,349	77%
Sutter/Clement	523	630	83%	0	523	83%	0	523	83%
Fulton/Hayes	1544	1,838	84%	0	1,544	84%	0	1,544	84%
Balboa	537	974	55%	0	537	55%	0	537	55%
Screenline Total	*6,866*	*8,815*	*78%*	*0*	*6,866*	*78%*	*0*	*6,866*	*78%*

Table 4.E.20 Continued

Muni Screenline	Baseline			Baseline Plus Project – Residential			Baseline Plus Project – Commercial		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Southeast									
Third Street	1,836	3,808	48%	280	2,116	56%	208	2,044	54%
Mission	1,927	2,632	73%	0	1,927	73%	0	1,927	73%
San Bruno/Bayshore	1,761	2,134	83%	0	1,761	83%	0	1,761	83%
Other lines	1,213	1,675	72%	76	1,289	77%	87	1,300	78%
Screenline Total	*6,737*	*10,249*	*66%*	*356*	*7,093*	*69%*	*295*	*7,032*	*69%*
Southwest									
Subway lines	5,433	6,804	80%	304	5,737	84%	354	5,787	**85%**
Haight/Noriega	1,065	1,596	67%	0	1,065	67%	0	1,065	67%
Other lines	655	840	78%	0	655	78%	0	655	78%
Screenline Total	*7,153*	*9,240*	*77%*	*304*	*7,457*	*81%*	*354*	*7,507*	*81%*
Muni Screenlines Total	*24,103*	*32,786*	*74%*	*731*	*24,834*	*76%*	*700*	*24,803*	*76%*
Individual Muni Routes									
22 Fillmore IB	436	939	46%	230	666	71%	301	737	78%
22 Fillmore OB	400	939	43%	213	613	65%	177	577	61%
48 Quintara/24th Street IB	160	252	63%	211	371	**147%**	274	434	**172%**
48 Quintara/24th Street OB	213	252	**85%**	196	409	**162%**	161	374	**148%**
T Third IB	1,940	3,808	51%	280	2,220	58%	208	2,148	56%
T Third OB	1,742	3,808	46%	304	2,046	54%	354	2,096	55%

Notes:
Bold indicates capacity utilization of 85 percent or greater.

Source: Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

Impact TR-4: The Proposed Project would not result in any Muni screenlines exceeding 85 percent capacity utilization nor would it increase ridership by more than five percent on any Muni screenline forecast to exceed 85 percent capacity utilization under Baseline Conditions without the Proposed Project. (*Less than Significant*)

As shown on pp. 4.E.87-4.E.88, capacity utilization at the four Downtown Muni screenlines would range from 65 percent at the northwest screenline in the a.m. peak hour to 92 percent at the southwest screenline in the a.m. peak hour under Baseline Conditions. Both the Maximum Residential Scenario and Maximum Commercial Scenario would add riders to the northeast, southeast, and southwest screenlines. The addition of riders from the Proposed Project would increase capacity utilization but would not cause any of the screenlines that operate below 85 percent capacity utilization to exceed the 85 percent standard. Some sub-corridors within the screenlines would exceed 85 percent capacity utilization. Specifically, the "other lines" sub-corridor within the Southeast screenline would operate at 94 percent and 96 percent in the Maximum Residential and Maximum Commercial scenarios, respectively, in the a.m. peak hour. However, the overall screenline would operate within the 85 percent capacity utilization standard and conditions on this screenline are considered acceptable.

Capacity utilization at the southwest screenline would increase from 92 percent to 95 percent under the Maximum Residential Scenario and 96 percent under the Maximum Commercial Scenario in the a.m. peak hour. Furthermore, the "subway lines" sub-corridor within the southwest screenline would increase capacity utilization in the a.m. peak hour from 95 percent under Baseline Conditions to 101 percent and 102 percent capacity utilization under the Maximu Residential and Maximum Commercial scenarios, respectively. However, the Proposed Project would add less than 5 percent to the baseline ridership at the overall screenline. Therefore, because the Proposed Project would not cause any screenline to exceed its capacity utilization threshold and because the Proposed Project would not increase capacity utilization by more than 5 percent on any screenline forecasted to exceed its capacity utilization threshold under Baseline Conditions without the Proposed Project, the impact would be less than significant and no mitigation is required.

Impact TR-5: The Proposed Project would cause one individual Muni route to exceed 85 percent capacity utilization in the a.m. and p.m. peak hours in both the inbound and outbound directions. (*Significant and Unavoidable with Mitigation*)

The T Third light rail line (renamed from the KT Third/Ingleside route following completion of the Central Subway) as well as the 22 Fillmore and the 48 Quintara/24th Street bus routes under Baseline Conditions operate within the capacity utilization standard of 85 percent in the a.m. and p.m. peak period. With ridership generated by the Maximum Residential Scenario and Maximum

Commercial Scenario, the T Third light rail line and 22 Fillmore bus route would continue to operate below 85 percent capacity utilization. However, the 48 Quintara/24th Street routes would exceed 85 percent capacity utilization inbound and outbound with project implementation. This would occur in the a.m. and p.m. peak hours.

Maximum Residential Scenario

The Proposed Project would cause the capacity utilization of the 48 Quintara/24th Street to increase from 47 percent to 106 percent in the inbound direction and from 79 percent to 168 percent in the outbound direction in the a.m. peak hour under the Maximum Residential Scenario. Under this same scenario, in the p.m. peak hour, the Proposed Project would cause the capacity utilization of the 48 Quintara/24th Street to increase from 63 percent to 147 percent in the inbound direction and from just under 85 percent to 162 percent in the outbound direction. Project-generated ridership would be 56 percent of the inbound 48 Quintara/24th Street ridership and 53 percent of the outbound ridership on the 48 route at the MLP in the a.m. peak hour. In the p.m. peak hour, project-generated ridership would be 57 percent of the ridership on the 48 Quintara/24th Street route in the inbound direction and 48 percent in the outbound direction.

Maximum Commercial Scenario

The Proposed Project would cause the capacity utilization of the 48 Quintara/24th Street to increase from 47 percent to 94 percent in the inbound direction and from 79 percent to 206 percent in the outbound direction in the a.m. peak hour under the Maximum Commercial Scenario. Under this same scenario, in the p.m. peak hour, the Proposed Project would cause the capacity utilization of the 48 Quintara/24th Street to increase from 63 percent to 172 percent in the inbound direction and from just under 85 percent to 148 percent in the outbound direction. Project-generated ridership would be 50 percent of the inbound 48 Quintara/24th Street ridership and 62 percent of the outbound ridership on the 48 route in the a.m. peak hour. In the p.m. peak hour, project-generated ridership would be 63 percent of the ridership on the 48 Quintara/24th Street route in the inbound direction and 43 percent in the outbound direction.

This would be a significant impact on this Muni route under either scenario of the Proposed Project. In order to reduce this impact to less-than-significant levels, additional transit capacity along the 48 Quintara/24th Street bus route would be required.

Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed.

Prior to approval of the Proposed Project's phase applications, project sponsors shall demonstrate that the capacity of the 48 Quintara/24th Street bus route has not exceeded 85 percent capacity utilization, and that future demand associated with build-out and occupancy of the phase will not cause the route to exceed its utilization. Forecasts of

travel behavior of future phases could be based on trip generation rates forecast in the EIR or based on subsequent surveys of occupants of the project, possibly including surveys conducted as part of ongoing TDM monitoring efforts required as part of Air Quality Mitigation Measure M-AQ-1f: Transportation Demand Management, p. 4.G.47-4.G.50.

If trip generation calculations or monitoring surveys demonstrate that a specific phase of the Proposed Project will cause capacity on the 48 Quintara/24th Street route to exceed 85 percent, the project sponsors shall provide capital costs for increased capacity on the route in a manner deemed acceptable by SFMTA through the following means:

- The project sponsors shall pay the capital costs for additional buses (up to a maximum of four in the Maximum Residential Scenario and six in the Maximum Commercial Scenario). While the project sponsors could assist with purchasing the buses, SFMTA would need to find funding to pay for the added operating cost associated with operating increased service made possible by the increased vehicle fleet. The source of that funding has not been established.

Alternatively, if SFMTA determines that other measures to increase capacity along the route would be more desirable than adding buses, the project sponsors shall pay an amount equivalent to the cost of the required number of buses toward completion of one or more of the following, as determined by SFMTA:

- Convert to using higher-capacity vehicles on the 48 Quintara/24th Street route. In this case, the project sponsors shall pay a portion of the capital costs to convert the route to articulated buses. Some bus stops along the route may not currently be configured to accommodate the longer articulated buses. Some bus zones could likely be extended by removing one or more parking spaces; in some locations, appropriate space may not be available. The project sponsors' contribution may not be adequate to facilitate the full conversion of the route to articulated buses; therefore, a source of funding would need to be established to complete the remainder, including improvements to bus stop capacity at all of the bus stops along the route that do not currently accommodate articulated buses.
- SFMTA may determine that instead of adding more buses to a congested route, it would be more desirable to increase travel speeds along the route. In this case, the project sponsors' contribution would be used to fund a study to identify appropriate and feasible improvements and/or implement a portion of the improvements that would increase travel speeds sufficiently to increase capacity along the bus route such that the project's impacts along the route would be determined to be less than significant. Increased speeds could be accomplished by funding a portion of the planned bus rapid transit system along 16th Street for the 22 Fillmore between Church and Third streets. Adding signals on Pennsylvania Street and 22nd Street may serve to provide increased travel speeds on this relatively short segment of the bus routes. The project sponsors' contribution may not be adequate to fully achieve the capacity increases needed to reduce the project's impacts and SFMTA may need to secure additional sources of funding.
- Another option to increase capacity along the corridor is to add new a Muni service route in this area. If this option is selected, project sponsors shall fund

purchase of the same number of new vehicles outlined in the first option (four for the Maximum Residential Alternative and six for the Maximum Commercial Alternative) to be operated along the new route. By providing an additional service route, a percentage of the current transit riders on the 48 Quintara/24th Street would likely shift to the new route, lowering the capacity utilization below the 85 percent utilization threshold. As for the first option, funding would need to be secured to pay for operating the new route.

Implementing any of the components of Mitigation Measure M-TR-5 would allow Muni to maintain transit headways, and would reduce the Proposed Project's impact to less-than-significant levels. Implementation of features of the mitigation measure above that would require discretionary approval actions by the SFMTA or other public agencies (including allocation of funds to operate increased frequencies) is considered uncertain because public agencies subject to CEQA cannot commit to implementing any part of a proposed project, including proposed mitigation measures, until environmental review is complete. Thus, while the SFMTA has reviewed the feasibility of the options listed above, implementation of these measures cannot be assured until after certification of this EIR. Because it is unknown whether M-TR-5 would be implemented, project-related impacts on the 48 Quintara/24th Street would be significant and unavoidable.

Impact TR-6: Two individual Muni routes would continue to operate within the 85 percent capacity utilization standard in the a.m. and p.m. peak hours in both the inbound and outbound directions with addition of the Proposed Project. (*Less than Significant*)

With implementation of the Proposed Project, both the T Third light rail and the 22 Fillmore bus route would operate within the 85 percent capacity utilization in the a.m. and p.m. peak hours in both the inbound and outbound directions under both the Maximum Residential and Maximum Commercial scenarios. As a result, the Proposed Project's impacts on those individual routes would be less than significant.

Impact TR-7: The Proposed Project would not cause significant impacts on regional transit routes. (*Less than Significant*)

As shown in Table 4.E.21: Regional Transit Screenlines – Baseline Plus Project (A.M. Peak Hour) and Table 4.E.22: Regional Transit Screenlines – Baseline Plus Project (P.M. Peak Hour), transit carriers to the North Bay and South Bay and Peninsula do not exceed their established capacity utilization standards under Baseline Conditions in the a.m. or p.m. peak hour. The East Bay screenline does exceed its established capacity utilization threshold in the a.m. peak hour (primarily due to overcrowding on BART). The East Bay screenline operates within its established capacity utilization threshold in the p.m. peak hour (although BART remains overcrowded during that peak hour between San Francisco and the East Bay).

Table 4.E.21: Regional Transit Screenlines – Baseline Plus Project (A.M. Peak Hour)

Regional Screenline	Baseline (Inbound)			Baseline Plus Project – Residential (Inbound)			Baseline Plus Project – Commercial (Inbound)		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay									
BART	28,000	25,680	**109%**	137	28,137	**110%**	177	28,177	**110%**
AC Transit	1,596	2,829	56%	16	1,612	57%	21	1,617	57%
Ferries	818	1,170	70%	8	8126	71%	10	828	71%
Screenline Total	30,414	29,679	**102%**	*161*	*30,575*	***103%***	*208*	*30,622*	***103%***
North Bay									
Golden Gate Transit Bus	1,344	2,543	53%	66	1,410	55%	80	1,424	56%
Ferries	1,088	1,959	56%	0	1,088	56%	0	1,088	56%
Screenline Total	*2,432*	*4,502*	*54%*	*66*	*2,498*	*55%*	*80*	*2,512*	*56%*
South Bay									
BART	16,000	21,400	75%	53	16,053	75%	61	16,061	75%
Caltrain	2,258	3,100	73%	435	2,693	87%	516	2,774	89%
SamTrans	266	520	51%	11	277	53%	12	278	53%
Screenline Total	18,524	25,020	74%	*499*	*19,023*	*76%*	*589*	*19,113*	*76%*
Regional Screenlines Total	51,370	59,201	87%	*726*	*52,096*	*88%*	*877*	*52,247*	*88%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

Source: Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

Table 4.E.22: Regional Transit Screenlines – Baseline Plus Project (P.M. Peak Hour)

Regional Screenline	Baseline (Outbound)			Baseline Plus Project – Residential (Outbound)			Baseline Plus Project – Commercial (Outbound)		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay									
BART	27,000	25,680	**105%**	119	27,119	**106%**	89	27,089	**105%**
AC Transit	2,297	3,926	59%	14	2,311	59%	11	2,308	59%
Ferries	813	1,615	50%	7	820	51%	5	818	51%
Screenline Total	30,110	31,221	96%	*140*	*30,250*	*97%*	*105*	*30,215*	*97%*
North Bay									
Golden Gate Transit Bus	1,399	2,817	50%	57	1,456	52%	41	1,440	51%
Ferries	973	1,959	50%	0	973	50%	0	973	50%
Screenline Total	2,372	4,776	50%	*57*	*2,429*	*51%*	*41*	*2,413*	*51%*
South Bay									
BART	15,000	21,400	70%	46	15,046	70%	31	15,031	70%
Caltrain	2,472	3,100	80%	379	2,851	92%	261	2,733	88%
SamTrans	147	320	46%	9	156	49%	6	153	48%
Screenline Total	*17,619*	*24,820*	*71%*	*434*	*18,053*	*73%*	*298*	*17,917*	*72%*
Regional Screenlines Total	*50,101*	*60,817*	*82%*	*631*	*50,732*	*83%*	*444*	*50,545*	*83%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

Source: Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

Maximum Residential Scenario

Development under the Maximum Residential Scenario would generate 161 transit person-trips from the East Bay, 66 transit person-trips from the North Bay, and 499 transit person-trips from the South Bay in the inbound direction in the a.m. peak hour. In the outbound direction in the p.m. peak hour, the Maximum Residential Scenario would generate 140 transit person-trips to the East Bay, 57 transit person-trips to the North Bay, and 434 transit person-trips to the South Bay. The East Bay regional screenline would exceed its capacity utilization threshold in the a.m. peak hour. However, the Proposed Project would not increase the ridership by more than 5 percent during the a.m. peak hour. Although the BART line to the East Bay would exceed its capacity utilization threshold in the p.m. peak hour, the overall East Bay regional screenline would not exceed its capacity utilization threshold in the p.m. peak hour with the addition of project-related

trips. None of the other regional screenlines would exceed capacity utilization standards in either the a.m. or p.m. peak with the addition of project-generated trips.

The Maximum Residential Scenario would not result in a significant impact on regional transit service, and no mitigation would be necessary.

Maximum Commercial Scenario

Development under the Maximum Commercial Scenario would generate 208 transit person-trips from the East Bay, 80 transit person-trips from the North Bay, and 589 transit person-trips from the South Bay in the inbound direction in the a.m. peak hour. In the outbound direction in the p.m. peak hour, the Proposed Project would generate 105 transit person-trips to the East Bay, 41 transit person-trips to the North Bay, and 288 transit person-trips to the South Bay. The East Bay regional screenline would exceed its capacity utilization threshold in the a.m. peak hour. However, similar to the Maximum Residential Scenario, the Proposed Project would not increase the ridership by more than 5 percent during the a.m. peak hour under the Maximum Commercial Scenario. Also similar to the Maximum Residential Scenario, the East Bay BART line would exceed its capacity utilization threshold in the p.m. peak hour. However, the overall East Bay regional screenline would not exceed its capacity utilization threshold in the p.m. peak hour with the addition of project-related trips.

Thus, with the exception of the East Bay regional screenline in the a.m. peak hour, none of the regional screenlines would exceed capacity utilization standards in either the a.m. or p.m. peak hours with the addition of project-generated trips. Although the East Bay regional screenline would exceed its capacity utilization threshold in the a.m. peak hour, the Proposed Project would not increase ridership by more than 5 percent.

The Maximum Commercial Scenario would not result in a significant impact on regional transit service, and no mitigation would be necessary.

PEDESTRIAN IMPACTS

The Proposed Project includes sidewalks throughout the project site, with widths ranging between 9 and 18 feet, including on new internal streets and on the existing streets on the perimeter of the project site. The Proposed Project would also complete the portion of the proposed Blue Greenway, a planned multi-use path along the eastern waterfront of San Francisco, along the project site's eastern frontage. The proposed sidewalk network is intended to comply with City standards for sidewalks on residential streets pursuant to the *Better Streets Plan*.

Pedestrian trips generated by the Proposed Project would include walking trips to and from the local and regional transit stops, as well as walking trips to and from nearby complementary land

uses. As shown in Table 4.E.15, the Proposed Project would generate 1,579 non-auto, non-transit trips in the a.m. peak hour and 3,083 during the weekday p.m. peak hour with the Maximum Residential Scenario. As shown in Table 4.E.16, the Proposed Project would generate 1,816 non-auto, non-transit trips in the a.m. peak hour and 3,367 during the weekday p.m. peak hour with the Maximum Commercial Scenario. Many of these trips would be pedestrian trips. In addition, many transit trips also end or begin with a walking trip to get to or from the transit stop and many of the internal trips identified would also be by foot. Non-auto, non-transit trips include walking, bicycle, motorcycle, taxi, and trips on other transportation modes.

Impact TR-8: Pedestrian travel generated by the Proposed Project could be accommodated on the new roadway and sidewalk network proposed for the project site. (*Less than Significant*)

The Proposed Project site plan and roadway improvements would provide for sidewalks along all streets on the project site. Sidewalks would range from 9 to 18 feet and would comply with City standards for sidewalks on residential streets. New intersections would be designed to City standards, as compact as possible and with all-way stop control, to provide a pedestrian-friendly design. The Proposed Project also includes a shared street treatment on Maryland Street. This street would have no curbs and would be designed to prioritize pedestrian travel.

The Proposed Project's parking structures would be dispersed throughout the site, with access points and driveways that could create conflicts with pedestrians. These conflicts are generally expected and a necessary part of provision of off-street parking, and garage entrances would comply with appropriate design standards, which are meant to provide for the safety of all roadway users.

Thus, the pedestrian-related features of the proposed site plan would not result in hazardous pedestrian conditions or present barriers to pedestrian accessibility. The Proposed Project would accommodate the pedestrian trips it would generate. Therefore, the impact would be less than significant and no mitigation is required.

Although, as noted above, the Proposed Project's parking facility access points would comply with appropriate design standards, the less-than-significant effect of vehicle queuing across sidewalks would be minimized with implementation of Improvement Measure I-TR-B: Queue Abatement, to ensure that pedestrian travel is unimpeded.

Improvement Measure I-TR-B: Queue Abatement

It should be the responsibility of the owner/operator of any off-street parking facility with more than 20 parking spaces (excluding loading and car-share spaces) to ensure that vehicle queues do not occur regularly on the public right-of-way. A vehicle queue is defined as one or more vehicles (destined to the parking facility) blocking any portion of

any public street, alley, or sidewalk for a consecutive period of 3 minutes or longer on a daily or weekly basis.

If a recurring queue occurs, the owner/operator of the parking facility should employ abatement methods as needed to abate the queue. Appropriate abatement methods will vary depending on the characteristics and causes of the recurring queue, as well as the characteristics of the parking facility, the street(s) to which the facility connects, and the associated land uses (if applicable).

Suggested abatement methods include but are not limited to the following: redesign of facility to improve vehicle circulation and/or on-site queue capacity; employment of parking attendants; installation of LOT FULL signs with active management by parking attendants; use of valet parking or other space-efficient parking techniques; use of off-site parking facilities or shared parking with nearby uses; use of parking occupancy sensors and signage directing drivers to available spaces; TDM strategies such as additional bicycle parking, customer shuttles, delivery services; and/or parking demand management strategies such as parking time limits, paid parking, time-of-day parking surcharge, or validated parking.

If the Planning Director, or his or her designee, suspects that a recurring queue is present, the Planning Department should notify the property owner in writing. Upon request, the owner/operator should hire a qualified transportation consultant to evaluate the conditions at the site for no less than 7 days. The consultant should prepare a monitoring report to be submitted to the Planning Department for review. If the Planning Department determines that a recurring queue does exist, the facility owner/operator should have 90 days from the date of the written determination to abate the queue.

Impact TR-9: Existing pedestrian facilities in the vicinity of the project site, while incomplete, would not pose substantial hazards to pedestrian traffic generated by the Proposed Project. (*Less than Significant*)

The Proposed Project does not include improving pedestrian facilities outside the project site, except for improvements along its frontage to Illinois Street, as discussed above on pp. 4.E.45. There are sidewalks along most of the streets in the area surrounding the project site. Existing pedestrian conditions near the project site occasionally lack fully accessible facilities such as curb ramps. The Proposed Project would generate pedestrian trips to and from transit stops at 20th and Third streets for the T Third Muni light rail line, and on 22nd Street under the I-280 freeway for Caltrain. The addition of pedestrians to the sidewalks on 20th and 22nd streets is not expected to result in substantial overcrowding or otherwise create potentially hazardous conditions for pedestrians. Additionally, the 22 Fillmore terminal stop at 20th and Tennessee streets and the 48 Quintara/24th Street terminal stop at 20th and Third streets have substantial sidewalk space for waiting passengers.

In addition, as part of a separate and ongoing planning effort, the City is conducting a planning process, led by the Planning Department, to improve the public realm in the Central Waterfront and Dogpatch neighborhoods, known as the Central Waterfront/Dogpatch Public Realm Plan.

The Plan area includes the blocks between Illinois Street, Cesar Chavez Street, I-280, and Mariposa Street. This planning process is generally designed to improve sidewalks, pedestrian crossings, and lighting in the area, as well as enhance streetscape features. Upon completion, the Plan will consist of a comprehensive set of smaller projects, prioritized so that as funding becomes available, the individual components of the plan may be constructed over time. As the study area becomes more fully built out, pedestrian conditions will further improve.

Although the Central Waterfront/Dogpatch Public Realm Plan would improve conditions for pedestrians, the existing conditions provide adequate pedestrian circulation in the study area, and the Proposed Project's impact would be less than significant and no mitigation is required.

Impact TR-10: Existing pedestrian facilities at the Proposed Project's access points would present barriers to accessible pedestrian travel. (*Less than Significant with Mitigation*)

The Proposed Project's access points would use existing stop-controlled intersections on Illinois Street at 20th Street and 22nd Street and a new intersection at the new 21st Street to be added west of Illinois Street. Several barriers to accessible pedestrian travel currently exist between these intersections, including missing ADA curb ramps at the intersection of 22nd Street and Illinois Street and a narrow stretch of sidewalk with obstructions mid-block on Illinois Street between 22nd and 20th streets. This lack of an accessible path of travel to and from the project site would be a significant impact. Additionally, the Proposed Project's transit riders would cross Illinois Street at the intersections with 20th, 21st, and 22nd streets. Although the Proposed Project is proposing to construct a new signal at the new intersection at Illinois Street and 21st Street, pedestrian crossings at the all-way stop controlled intersections along Illinois Street at 20th and 22nd streets would be particularly challenging, given forecasted increases in traffic along Illinois Street. This would also be a significant impact.

In order to improve pedestrian circulation and safety adjacent to the project site, new traffic signals, ADA curb ramps and improved sidewalks would be required to be constructed along the project's Illinois Street frontage.

Mitigation Measure M-TR-10: Improve pedestrian facilities on Illinois Street adjacent to and leading to the project site.

As part of construction of the Proposed Project roadway network, the project sponsors shall fund the following improvements:

- Install ADA curb ramps on all corners at the intersection of 22nd Street and Illinois Street
- Signalize the intersections of Illinois Street with 20th and 22nd streets.
- Modify the sidewalk on the east side of Illinois Street between 22nd and 20th streets to a minimum of 10 feet. Relocate obstructions, such as fire hydrants and

power poles, as feasible, to ensure an accessible path of travel is provided to and from the Proposed Project.

With implementation of this mitigation measure, the Proposed Project would provide appropriate pedestrian access along the boundary of the project site and along corridors to nearby transit stops. The impact would be reduced to less-than-significant levels.

BICYCLE IMPACTS

Impact TR-11: The Proposed Project would not create potentially hazardous conditions for bicyclists and would not interfere with bicycle accessibility to the project site or adjoining areas. (*Less than Significant*)

The Proposed Project would provide bicycle parking in compliance with the requirements of the San Francisco Planning Code. Under either the Maximum Residential Scenario or the Maximum Commercial Scenario, residential buildings with more than 50 residential units would be required to provide 25 Class 1 bicycle parking spaces (lockers, monitored bike parking, or other restricted-access parking areas) plus one additional Class 1 space for every four residential units after the first 50 units.[57] Commercial uses would be required to provide three bicycle parking spaces for buildings with 10,000 to 20,000 square feet of professional services space or 20,000 to 50,000 square feet of restaurant or personal services space; six bicycle parking spaces for buildings with 20,000 to 50,000 square feet of professional services space or 50,000 to 100,000 square feet of restaurant or personal services space; and 12 spaces for buildings with over 50,000 square feet of professional services space or 100,000 square feet of restaurant or personal services space. The Maximum Residential Scenario proposes 1,142 Class 1 bicycle parking spaces and 514 Class 2 (unprotected bike racks) bicycle parking spaces. The Maximum Commercial Scenario proposes 995 Class 1 and 475 Class 2 bicycle parking spaces. These amounts of bicycle parking would meet or exceed Planning Code requirements.

On the project site, bicycle facilities are proposed along 20th Street, 22nd Street, and Maryland Street. The same facilities would be provided with both the Maximum Residential Scenario and the Maximum Commercial Scenario. These roadways provide direct connections to and from external roadways such as Illinois Street for travel to and from the project site. The proposal for 22nd Street between Illinois Street and the new Louisiana Street includes a Class III shared bicycle lane in the eastbound direction and a striped and signed Class II bicycle lane in the westbound direction. The bicycle facilities on other streets on the project site would be Class III shared bicycle lanes with sharrows painted on the roadway surface. The Proposed Project also includes a bi-directional bicycle path along the east side of the project site on the waterfront, separate from

[57] Thus, a 100-unit residential building would be required to provide a total of 38 Class I bicycle parking spaces (25 for the first 50 residential units plus 12.5 for the remaining 50 units).

any vehicle travel lane, to be part of the Blue Greenway and Bay Trail and connecting the eastern waterfront with The Embarcadero.

The project site is within convenient bicycling distance of office and retail uses in the Dogpatch, Mission Bay, Mission, Potrero Hill, SOMA, and Bayview neighborhoods. There are bicycle routes near the project site, including bicycle lanes on Illinois Street (Route 5), Terry A Francois Boulevard (Route 5), 16th Street (Route 40), Fourth Street (Route 40), and several blocks of Cesar Chavez Street (Route 60), and bicycle routes on Indiana Street (Route 7), a portion of Mariposa Street and Minnesota Street (Route 7), and Cesar Chavez Street (Route 60).

Bicyclists heading to or from the south would use Illinois Street, the current alignment of the Bay Trail, to connect to Route 60, which provides connections to farther destinations and designated bicycle routes. Bicyclists heading to or from the north would use Terry A Francois Boulevard or Fourth Street, both designated bicycle routes, to connect to Routes 11, 36, and 40 that provide connections to farther destinations and designated bicycle routes. Routes 40, 44, and 60 provide east-west connections that cross I-80 into the Mission District. While the existing bicycle network does not include a designated east-west route that connects to the project site between Mariposa Street and Cesar Chavez Street, bicyclists can use 20th Street, a two-lane roadway with stop-controlled intersections that travels through residential areas and small neighborhood commercial districts, to travel to and from the Potrero Hill neighborhood directly to the project site. The intersection of 20th Street and the proposed Louisiana Street on the project site would allow bicyclists to connect to the proposed Blue Greenway and Bay Trail along the shoreline.

As discussed above, the Proposed Project would comply with the Planning Code requirements for bicycle parking, would not increase bicycle traffic to a level that adversely affects bicycle facilities in the area (the bicycle mode share of the Proposed Project would be similar to the mode share in other parts of San Francisco with substantial bicycle infrastructure), and would not create a new hazard or substantial conflict for bicycling. The Proposed Project would not adversely affect bicycle accessibility to the project site or adjoining areas. Thus, the Proposed Project's impact on bicycle facilities and circulation would be less than significant.

LOADING IMPACTS

Impact TR-12: The Proposed Project's loading demand during the peak loading hour would not be adequately accommodated by proposed on-site/off-street loading supply or in proposed on-street loading zones, which may create hazardous conditions or significant delays for transit, bicycles or pedestrians. (*Significant and Unavoidable with Mitigation*)

To minimize conflicts with pedestrians and bicyclists, a maximum of one loading access point would be permitted for each building frontage where off-street loading is planned. This

requirement would minimize curb cuts and prioritize pedestrian movement where a sidewalk is present. Exterior loading docks, where loading and unloading occurs outside of a building, would not be permitted, and commercial loading entries would be required to be at least 60 feet from the corner of an intersection. Waste collection facilities would be provided separately for each building and would be visually screened from the public right-of-way, minimizing conflicts with travelways. For the residential trash/recycling pickup, trash containers would be transported by the building staff from the trash rooms to the curb at the time of trash pickup and returned following pickup, or Recology personnel would access the trash rooms to retrieve the trash containers. For the commercial/non-residential uses, trash would be carted to the curb by building management or tenants of the commercial spaces, or Recology personnel would access the trash rooms to retrieve trash containers. Building management would coordinate with the appropriate disposal and recycling company regarding the specific locations of garbage containers.

The Proposed Project includes a shared street treatment on Maryland Street that would allow limited or no vehicular access at some times, either for special events or at designated times of day. However, for all buildings fronting Maryland Street service entrances would be provided on 21st, Louisiana, and 22nd streets (although on-street loading could still occur from Maryland Street during periods when the shared street was open to vehicular access). Thus, limiting or prohibiting delivery vehicles from accessing Maryland Street from time to time would not result in a significant impact because building service access would be retained.

Despite the fact that the Proposed Project would minimize loading conflicts with bicycles and pedestrians and would not result in significant loading impacts on the shared street, there would be a loading supply shortfall that would result in significant impacts.

Overall, the Maximum Residential Scenario would generate a demand for approximately 640 daily delivery and service vehicle trips, and the Maximum Commercial Scenario would generate a demand for approximately 855 daily delivery vehicle and service vehicle trips. Deliveries would be primarily small trucks and vans, typical of deliveries throughout the City.

The residential units in the Maximum Residential Scenario would generate a demand for four loading spaces in the average loading hour and five loading spaces in the peak loading hour (generally 1 hour between the hours of 10:00 a.m. and 1:00 p.m.). The residential units in the Maximum Commercial Scenario would generate a demand for two loading spaces in both the average and peak loading hours (see Table 4.E.23: Delivery/Service Vehicle Trips and Loading Demand).

The demand for loading spaces for non-residential uses would range from 26 spaces in the Maximum Residential Scenario to 38 spaces in the Maximum Commercial Scenario in the

average loading hour. In the peak loading hour, the demand for non-residential uses would be for 32 loading spaces in the Maximum Residential Scenario and 48 loading spaces in the Maximum Commercial Scenario.

Table 4.E.23: Delivery/Service Vehicle Trips and Loading Demand

Land Use	Size	Daily Truck Trip Generation Rate	Daily Truck Trip Generation[1]	Average Hour Loading Space Demand	Peak Hour Loading Space Demand
Maximum Residential Scenario					
Residential	3,025 units	0.03	79	4	5
Office/PDR	1,102,250 gsf	0.21	262	12	13
Retail	269,495 gsf	0.22	59	3	3
Restaurant	67,375 gsf	3.60	243	11	14
Total	**-**	**-**	**642**	**30**	**37**
Maximum Commercial Scenario					
Residential	1,645 units	0.03	43	2	2
Office/PDR	2,262,350 gsf	0.21	505	23	29
Retail	275,075 gsf	0.22	61	3	4
Restaurant	68,765 gsf	3.60	248	11	14
Total	**-**	**-**	**856**	**40**	**50**

Note: The sums of individual land use loading demands may not add to the total shown due to rounding.
[1] *SF Guidelines*, Table H-1.

Sources: SF Guidelines, 2002; Fehr & Peers, 2016; Adavant Consulting, 2015

The Proposed Project would include on-street and/or off-street loading spaces based on square footage of gross leasable area.[58] Table 4.E.24: Proposed Loading Space Ratios presents the minimum loading requirements that would be applicable to new uses on the project site under both the Maximum Residential Scenario and the Maximum Commercial Scenario as described in the Proposed Project's Design for Development guidelines. Each residential building would include one or two on-street or off-street loading spaces, depending on the size of the building. Commercial/office buildings with under 50,000 square feet of gross leasable area would not be required to provide loading spaces; between 50,001 and 100,000 square feet, one on-street loading space would be required; between 100,001 and 250,000 square feet, one off-street loading space would be required; between 250,001 and 500,000 square feet, two off-street loading spaces would be required; and over 500,000 square feet, three off-street loading spaces would be

[58] Forest City, *Pier 70 Design Guidelines*, Section 9.9 Loading and Services, p. 262-263. DRAFT April 1, 2015.

required. These requirements are similar to, but not the same as, Planning Code requirements for loading.

Table 4.E.24: Proposed Loading Space Ratios

Use	Gross Leasable Area	Minimum	Loading Space Type
Commercial/Office	0-50,000 GLA	Not Required	
	50,001-100,000 GLA	1	On-street
	100,001-250,000 GLA	1	Off-street
	250,001-500,000 GLA	2	Off-street
	500,001 and above GLA	3	Off-street
Retail	0-10,000 GLA	Not Required	
	10,001-30,000 GLA	1	On-street
	30,001-50,000 GLA	2	Off-street
	50,001 GLA and above	1 per 25,000 GLA	Off-street
Residential	0-225,000 GLA	1	On-street or Off-Street
	225,001 GLA and above	2	On-street or Off-street
RALI (Retail/Arts/Light Industrial)	0-50,000 GLA	Not required	
	50,001-150,000 GLA	1	On-street
	150,001-250,000 GLA	2	Off-street

Note:
GLA = Gross Leasable Area.

Source: Forest City, *Pier 70 SUD Design Guidelines*, DRAFT April 1, 2016.

When applied to the specific buildings proposed as part of the Proposed Project, the Proposed Project's loading supply would be 28 spaces in the Maximum Residential Scenario and 25 spaces in the Maximum Commercial Scenario. This would result in a shortfall of nine loading spaces during the peak hour of loading for the Maximum Residential Scenario and a shortfall of 25 loading spaces during the peak hour of loading for the Maximum Commercial Scenario.

Most residential loading demand would be generated when tenants move in and out of a residential unit. This loading would be either from off-street loading facilities or on-street, likely near the building entrances, depending on the size of building and loading facilities provided in the building. For residential buildings with off-street facilities, new tenants would coordinate with building management to reserve space at the off-street loading facilities provided by that building. For residential buildings with no off-street facilities, new tenants would either use on-street loading facilities, if available, or they could apply for a temporary "no parking" permit with SFMTA, which prohibits on-street public parking for a temporary period to allow for moving vans and trucks to park. Residential move-ins and move-outs are typically a relatively infrequent occurrence, except when a building is first occupied, such that the off-street loading facilities and

on-street curb space would likely be adequate for move-ins and move-outs. Residential buildings would generate parcel delivery vehicles (e.g., United Parcel Service and Federal Express vans) in addition to large moving vans. These parcel deliveries are usually short and would not substantially affect circulation around the project site. The one or two on-street or off-street loading spaces that would be required for each residential building would likely satisfy the residential loading demand. Therefore, extra on-street loading spaces would not be necessary in residential areas of the project site.

Non-residential deliveries of goods to businesses such as restaurants and retail tenants would occur at on-street loading spaces at least 75 feet long or in off-street loading areas as required for buildings serving commercial/office and RALI uses with more than 100,000 gross leasable square feet. Given the forecast loading space shortfalls for both the Maximum Residential Scenario and the Maximum Commercial Scenario, service and delivery vehicles may occasionally park in regular public parking spaces or double-park and partially block local streets while loading and unloading goods. Although this is a relatively common occurrence in San Francisco and a small shortfall would not be unusual, the scale of the Proposed Project's loading shortfall combined with its relatively narrow streets would constitute a significant impact.

Other than increasing the off-street loading space requirements in the Design for Development documentation to better match demand, it may be beyond the project sponsors' control to fully mitigate the significant impact. However, there are measures the project sponsors could take to reduce the severity of the impact. Those measures are outlined in Mitigation Measure M-TR-12, below.

Mitigation Measure M-TR-12A: Coordinate Deliveries

The Project's Transportation Coordinator shall coordinate with building tenants and delivery services to minimize deliveries during a.m. and p.m. peak periods.

Although many deliveries cannot be limited to specific hours, the Transportation Coordinator shall work with tenants to find opportunities to consolidate deliveries and reduce the need for peak period deliveries, where possible.

Mitigation Measure M-TR-12B: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed.

After completion of the first phase of the Proposed Project, and prior to approval of each subsequent phase, the project sponsors shall conduct a study of utilization of on- and off-street commercial loading spaces. The methodology for the study shall be reviewed and approved by the Planning Department prior to completion. If the result of the study indicates that fewer than 15 percent of the commercial loading spaces are available during the peak loading period, the project sponsors shall incorporate measures to convert existing or proposed general purpose on-street parking spaces to commercial parking spaces in addition to the required off-street spaces.

Implementation of Mitigation Measures M-TR-12A and M-TR-12B may not fully resolve the loading shortfall, as the project's Transportation Coordinator may not be able to shift on-site delivery times. Additionally, there may not be an adequate supply of on-street general purpose parking spaces to convert to commercial loading spaces such that the loading shortfall can be accommodated on-street. Thus, even with implementation of Mitigation Measures M-TR-12A and M-TR-12B, the Proposed Project's loading impacts would remain significant and unavoidable.

EMERGENCY ACCESS

Impact TR-13: The Proposed Project would not result in significant impacts on emergency access to the project site or adjacent locations. (*Less than Significant*)

Emergency access to the project site would remain essentially unchanged compared to existing conditions. Emergency vehicles would continue to access the site from Third Street, Illinois Street, 20th Street, and 22nd Street. Additionally, the Proposed Project would add a new connection to the site from Illinois Street at 21st Street. Aside from the general increase in vehicle traffic described in the Proposed Project's Transportation Impact Study that would result from the additional activity at the site, the Proposed Project would not inhibit emergency access to the project site.

Internal to the project site, most roadways are proposed to have at least 22 feet curb-to-curb width to accommodate emergency vehicles (including bicycle lanes but not including parking bays). A portion of the new 21st Street between Louisiana Street and the waterfront open space would have a clear right-of-way of about 20 feet. Also, between 20th and 21st streets, Louisiana Street would have a single 15-foot travel lane and one 12-foot loading bay. The Design for Development document (*Pier 70 SUD Design Guidelines*) presents turning radii analyses completed for WB-40 (wheelbase of 40 inches), WB-50, and WB-62 design vehicles (i.e., large semi-trailer trucks) that shows all vehicle movements could be achieved with the proposed network.[59] Standard emergency vehicles in San Francisco typically have better maneuverability than these design vehicles; thus, emergency vehicle turning radii would be accommodated by the Proposed Project's street layout.

As discussed for loading, if Maryland Street is to be closed to vehicular access on some occasions, the planned service passageways would provide access to emergency services providers during those temporary closure periods.

[59] *Transportation Impact Study* Section 5.7, p. 125, citing Forest City, *Pier 70 Design Guidelines*, p. 262 DRAFT, April 1, 2015.

Development of the project site, and associated increases in vehicles, pedestrians, and bicycle travel would not substantially affect emergency vehicle access to other buildings and areas within adjacent Mission Bay, including the UCSF campus, which is just over 0.5 mile from the project site. The UCSF Medical Center Phase 1 contains an emergency room and urgent care center for the UCSF Children's Hospital at the southern end of the hospital complex, with access from Fourth Street, north of Mariposa Street. Access to the Fourth Street urgent care center is directly from Mariposa Street, or from Owens Street via the Southern Connector Road (an internal road within the Medical Center campus site that provides access between the south Medical Center entrance and the parking facilities). Owens Street can be accessed from 16th Street, the I-280 northbound off-ramp, and Mariposa Street. A number of roadway improvements are currently under construction as part of Phase 1 of the UCSF Medical Center that enhance access to UCSF and critical hospital services, including extending Owens Street between Mariposa and 16th streets, widening Mariposa Street to five lanes, installing a new signal at the Mariposa Street and Owens Street intersection, adding a lane on the I-280 northbound off-ramp at Mariposa Street, and constructing a new signal at Mariposa Street at the I-280 northbound off-ramp. On Mariposa Street, if necessary, emergency vehicles and other persons accessing the emergency room and urgent care center in their personal vehicles during an emergency would be able to travel within the center left-turn lane to access the intersection of Fourth and Mariposa streets. Therefore, circulation in the area is expected to improve with completion of these new roadway connections within Mission Bay. Further, an emergency route along Mariposa Street (the center left-turn lane) and along Third Street (the transit-only lanes) would be available along key corridors in the study area. Therefore, the Proposed Project would not result in substantial increases in vehicle delay for emergency vehicles or other persons accessing the emergency room and urgent care center in their personal vehicles.

During events at AT&T Park, approximately 1.5 miles from the project site, pre-event and post-event vehicular traffic are managed to minimize impacts on emergency vehicle circulation and access. During pre-event conditions at AT&T Park, up to 21 Parking Control Officers (PCOs) are stationed at 17 locations. During post-event conditions, up to 19 PCOs are stationed at 14 locations. This includes intersections along Third Street, Mission Rock Street, and Terry A Francois Boulevard. If necessary, emergency vehicles would be able to travel on Muni's light rail right-of-way in the median of Third Street. Persons accessing the UCSF Medical Center emergency room and urgent care center in their personal vehicles during an emergency would, if necessary, also be able to utilize the transit-only lanes to bypass congested segments on 16th Street. On Mariposa Street, emergency vehicles and other persons accessing the emergency room and urgent care center in their personal vehicles during an emergency would be able to travel within the center left-turn lane to access the intersection of Fourth and Mariposa streets. PCOs deployed for major events at AT&T Park would have the capability to respond to conflicts between event center traffic and UCSF hospital access. PCOs also have the capability to radio

ahead to other downstream PCOs to inform them of approaching vehicles requiring emergency access. Although the Proposed Project may increase traffic in the vicinity of AT&T Park on event days, the Proposed Project's increment of increase is likely small relative to the event-related traffic, and the event traffic management systems described above are designed to adapt to changes in traffic and would remain effective with implementation of the Proposed Project.

In the circumstance of simultaneous events at AT&T Park and the Proposed Project site, the event sponsors at the Proposed Project would be required to develop a TDM Plan as noted earlier that accounts for projected congestion in the area. Additionally, event traffic management systems at AT&T Park are reviewed and refined continuously to plan for such simultaneous events. Therefore, both events would likely develop refinements to their plans that ensure emergency vehicle circulation is accommodated.

Although not required to address significant impacts, implementation of Improvement Measure I-TR-C: Strategies to Enhance Transportation Conditions During Events would ensure that events at Pier 70 are coordinated with events at AT&T Park to further reduce the less-than-significant effects of congestion on emergency vehicle circulation.

> **Improvement Measure I-TR-C: Strategies to Enhance Transportation Conditions During Events.**
>
> The project's Transportation Coordinator should participate as a member of the Mission Bay Ballpark Transportation Coordination Committee (MBBTCC) and provide at least 1-month notification where feasible prior to the start of any then known event that would overlap with an event at AT&T Park. The City and the project sponsors should meet to discuss transportation and scheduling logistics for occasions with multiple events in the area.

The San Francisco Fire Department will be required to review and approve the internal circulation plan for Pier 70 prior to construction of any roadways. Because the Proposed Project would not substantially interfere with emergency access and, with clearance from the Fire Department, the Proposed Project's street system would accommodate emergency vehicle circulation on-site, the Proposed Project would have a less-than-significant impact on emergency access.

CUMULATIVE IMPACTS

The geographic context for the analysis of cumulative impacts is the transportation study area shown on Figure 4.E.1: Transportation Study Area and Study Intersections, on p. 4.E.2. As discussed in Section 4.A, Introduction to Chapter 4, on pp. 4.A.12-4.A.18, the cumulative impacts analysis takes into account reasonably foreseeable future development projects in the study area that would contribute to use of the transportation system. The 2040 future cumulative baseline is

established using the SF-CHAMP travel demand model that uses a forecast of citywide growth. The cumulative analysis for transportation is, therefore, a projections approach rather than a list-based approach. However, the model has been reviewed to ensure that it includes travel from expected growth in and near the transportation study area in addition to projects included in the Baseline Conditions, including that from build-out of Mission Bay, the Golden State Warriors Event Center and Mixed-Use Development Project in Mission Bay, the UCSF Long Range Development Plan, the Mission Rock Mixed-Use Project, and various individual development projects in the Eastern Neighborhoods Plan area.

The 2040 SF-CHAMP model run also accounts for reasonably foreseeable transportation improvements. Key improvements assumed in addition to those in the Baseline Conditions are those in the *San Francisco Bicycle Plan* and Second Street Improvement Project, further transit improvements approved in Muni Forward (formerly the Transit Effectiveness Project), and further from the project site the Van Ness BRT project and the Geary BRT project.

Included in the list of reasonably foreseeable developments is the new Warriors Arena in Mission Bay. Because the Arena will affect conditions in the study area in Cumulative conditions, a summary of the ways in which the Arena intends to manage game day conditions is provided for informational purposes.[60]

During events with more than 12,500 attendees, traffic management procedures similar to those employed at AT&T Park on game days will be implemented, including PCOs stationed at key intersections in the project vicinity to manage vehicular, transit, bicycle, and pedestrian flows. SFMTA fare inspectors will be on-hand to manage flows of passengers onto the transit vehicles. Additionally, three permanent Variable Message Signs will be installed to provide traffic alerts, messages, and alternate driving routes for drivers traveling to the event center, to destinations in the vicinity, or through the area. Overall, the Warriors Arena project was found to have significant effects on the transportation and circulation network, which were evaluated and disclosed in that project's EIR.

[60] The following text is from *Event Center and Mixed-Use Development at Mission Bay Blocks 29-32 Subsequent Environmental Impact Report*, pp. 5.2-58 and 5.2-60, Planning Department Case No. 2014.1441E, State Clearinghouse No. 2014112045, certified November 3, 2015. Available at http://sf-planning.org/environmental-impact-reports-negative-declarations. Accessed 7/11/16.

CUMULATIVE CONSTRUCTION IMPACTS

Impact C-TR-1: Construction of the Proposed Project would occur over an approximately 11-year timeframe and may overlap with construction of other projects in the vicinity. (*Less than Significant*)

Construction staging for most or all of the proposed infrastructure, structures, and landscaping would occur on the project site, based on the size of the site. Construction activities for the Proposed Project would likely overlap with construction of the 20th Street Historic Core Project on Pier 70 and Crane Cove Park, both adjacent to the project site, one or more of the remaining development projects in Mission Bay, the new Warriors Arena, and the Mission Rock Mixed-Use Project, among other construction projects expected to occur in the vicinity in the next 10+ years. The precise timing of these projects is not known at present. Construction vehicles for the Proposed Project and other nearby projects would use many of the same roads and freeway ramps. As part of the construction permitting process, the construction manager for each project would be required to meet with various City departments and the TASC to develop a detailed plan that includes coordination with other nearby construction activities. The plan would address construction vehicle routing, traffic control, transit routes, and pedestrian movements adjacent to the construction area during any overlapping construction periods. Due to the detailed planning and coordination requirements described above, the Proposed Project would not contribute considerably to a significant cumulative impact in the area.

The less-than-significant impacts would be further reduced with implementation of Improvement Measure I-TR-A: Construction Management Plan identified above under Impact TR-1.

CUMULATIVE VMT MPACTS

Impact C-TR-2: The Proposed Project's incremental effects on regional VMT would not be significant, when viewed in combination with past, present, and reasonably foreseeable future projects. (*Less than Significant*)

San Francisco 2040 cumulative conditions were projected using an SF-CHAMP model run, using the same methodology as outlined for existing conditions, but including residential and job growth estimates and reasonably foreseeable transportation investments through 2040. Projected 2040 average daily VMT per capita for residential uses is 6.4 for the transportation analysis zone where the project site is located (TAZ 559). This is 60 percent below the 2040 projected regional average daily VMT per capita of 16.1 for residential uses. Projected 2040 average daily VMT per capita for office uses is 10.1 for the project site's TAZ. This is 41 percent below the 2040 projected regional average daily VMT per capita of 17.1 for office uses. Projected 2040 average daily VMT per capita for retail uses is 11.9 for the project site's TAZ. This is 18 percent below the 2040 projected regional average daily VMT per capita of 14.6 for retail uses.

Because the project site is located in an area where VMT is greater than 15 percent below the projected 2040 regional averages for residential, office, and retail uses, the Proposed Project's incremental effects would not be significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of reasonably foreseeable future projects

The Proposed Project is not a transportation project. However, the Proposed Project would include features that would alter the transportation network. As discussed in the evaluation of project impacts, these features fit within the general types of projects identified above that would not substantially induce automobile travel.[61] Therefore, the Proposed Project would not have a considerable contribution to any substantial cumulative increase in automobile travel.

Based on the above factors and data demonstrating San Francisco's low per-household GHG consumption, GHG reductions exceeding BAAQMD and state GHG reductions goals, and consistency with *Plan Bay Area*, the Planning Department has determined that regardless of any increased volume of VMT and GHG emissions, if a project is located within an area where the percent by which per capita VMT is more than 15 percent below the projected 2040 per capita regional averages for residential, office, and retail uses, the project's incremental effects would not be significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

Therefore, the proposed project would not have a considerable contribution to any substantial cumulative increase in automobile travel. Cumulative VMT impacts are considered ***less than significant***.

CUMULATIVE TRAFFIC IMPACTS

The Proposed Project would have a considerable contribution to a significant cumulative impact to traffic if it, in combination with other long-term forecasted growth by year 2040, contributed to a major traffic hazard in the study area. In general, the Proposed Project and other local and regional growth would add vehicle trips to the surrounding roadways; however, a general increase in traffic in and of itself would not be considered a traffic hazard.

Impact C-TR-3: The Proposed Project would not contribute to a major traffic hazard. (*Less than Significant*)

Consistent with the City's *Better Streets Plan* and Transit First Policy, roadway improvements throughout the City – including the study area – are contemplated to improve overall safety and encourage non-automobile modes of transportation. Although growth is expected to increase

[61] Ibid.

traffic volumes somewhat in the future, that increase alone is not considered a significant hazard. As described earlier, the Proposed Project's internal roadway system would be designed to reduce traffic speeds and promote walking and bicycling and is not expected to create a major traffic hazard. Other long-term forecasted changes to the study area are also anticipated to encourage bicycling, pedestrian, and transit use, and are expected to further enhance the area safety.

The new Warriors Arena will be constructed and operational in the Cumulative Conditions. However, that project includes a detailed transportation management plan to ensure that travelers to the area are accommodated efficiently with minimal disruptions to bicycle, pedestrian, transit, and emergency vehicle access in the study area. Thus, no significant cumulative long-term traffic hazards would be expected in the study area, and the Proposed Project would not contribute to any cumulative traffic hazard impacts.

CUMULATIVE TRANSIT IMPACTS

Future year 2040 Cumulative ridership projections were developed based on transit growth projections developed for the Transit Effectiveness Project (Muni Forward) and provided by the Planning Department. Forecast future hourly ridership demand was then compared to expected hourly capacity, as determined by the likely route and headway changes identified in the Muni Forward to estimate capacity utilization under 2040 Cumulative conditions. The year 2040 Cumulative analysis assumes changes to the capacity of the lines as identified by route changes and headway changes indicated in future improvements under Muni Forward. The changes incorporated in the Cumulative conditions analysis are:

- On the T Third Muni Metro line, peak period headways would be reduced and two-car trains would be operated.
- The 10 Townsend bus route would be rerouted off Townsend Street down Fourth Street. From Fourth Street, the route would extend through Mission Bay to new proposed street segments on Seventh Street between Mission Bay Boulevard and Hubble Street, on Hubble Street between Seventh and 16th streets, on 16th Street between Hubble and Connecticut streets, and on Connecticut Street between 16th and 17th streets. Peak period headways would be reduced from 20 to 6 minutes. Midday headways would be reduced from 20 to 12 minutes. The 10 Townsend would be renamed the 10 Sansome.
- The 22 Fillmore trolley bus route would extend down 16th Street and Third Street to the UCSF Mission Bay campus and is part of a BRT proposal that would remove a general-use travel lane on 16th Street through the study area. The 33 Stanyan would be re-routed from Potrero to cover the portion of the 22 route currently serving 18th Street.
- The 48 Quintara/24th Street bus route would operate all day from 48th Avenue to the Hunters Point Naval Shipyard. At 25th and Connecticut streets, this route would no longer follow the existing alignment and would change to follow the existing 19 Polk route to Hunters Point via Evans and Innes avenues. This would provide a new connection from the Mission District, Noe Valley, and the Sunset to Third Street and

Hunters Point. This route will also be re-branded as the 58 as part of Muni Forward improvements.

The transit person-trips forecast to be generated by the Proposed Project were compared to the projections for Cumulative conditions at the four Muni screenlines as well as on an individual route basis for the routes that serve the project site. Table 4.E.25: Muni Downtown Screenlines – Cumulative Conditions A.M. Peak Hour and Table 4.E.26: Muni Downtown Screenlines – Cumulative Conditions P.M. Peak Hour summarize Cumulative 2040 transit. A cumulatively significant impact would occur if reasonably foreseeable development (i.e., cumulative conditions) would cause any of the individual routes or Downtown screenlines to exceed their capacity utilization thresholds, or would increase ridership by more than 5 percent if individual routes or Downtown screenlines are already exceeding their capacity utilization thresholds under Baseline conditions. The Proposed Project would be considered to have a considerable contribution to a significant cumulative impact if it would contribute more than 5 percent of the forecasted cumulative growth in ridership to any of the individual routes serving the project site or to any Downtown screenlines that are projected to experience a significant cumulative impact.

Impact C-TR-4: The Proposed Project would contribute considerably to significant cumulative transit impacts on the 48 Quintara/24th Street and 22 Fillmore bus routes. (*Significant and Unavoidable with Mitigation*)

In combination with reasonably foreseeable development expected to occur under Cumulative Conditions, the Proposed Project would cause the 48 Quintara/24th Street bus route to exceed 85 percent utilization in both the Maximum Residential Scenario and the Maximum Commercial Scenario during the a.m. and p.m. peak hours. The Proposed Project would contribute 48 to 61 percent of the ridership on this bus route in the a.m. peak hour and 53 to 60 percent of the ridership in the p.m. peak hour. This would be a considerable contribution to a significant cumulative impact on individual transit routes.

Mitigation Measure M-TR-5, to increase capacity on the 48 Quintara/24th Street bus route, as presented above under Impact TR-5, could reduce the Proposed Project's contribution to this significant cumulative impact. Under the Maximum Commercial Scenario, Mitigation Measure M-TR-5 would be adequate to reduce the Proposed Project's contribution to the significant cumulative impact to not considerable. Under the Maximum Residential Scenario, the Proposed Project's contribution would remain considerable even with the implementation of Mitigation Measure M-TR-5. Therefore, additional mitigation would be necessary for the Maximum Residential Scenario to reduce the considerable contribution to the significant cumulative impact on Muni service on this route.

Table 4.E.25: Muni Downtown Screenlines – Cumulative Conditions A.M. Peak Hour

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast												
Kearny/Stockton	2,273	3,157	72%	7,394	9,473	78%	0	7,394	78%	0	7,394	78%
Other lines	710	1,141	62%	758	1,785	42%	54	812	45%	37	795	45%
Screenline Total	2,983	4,298	69%	*8,152*	*11,258*	*72%*	*54*	*8,206*	*73%*	*37*	*8,189*	*73%*
Northwest												
Geary	2,302	3,764	61%	2,673	3,763	71%	0	2,673	71%	0	2,673	71%
California	1,436	2,010	71%	1,989	2,306	**86%**	0	1,989	**86%**	0	1,989	**86%**
Sutter/Clement	514	630	82%	581	756	77%	0	581	77%	0	581	77%
Fulton/Hayes	1,505	2,237	67%	1,962	1,977	**99%**	0	1,962	**99%**	0	1,962	**99%**
Balboa	553	1,008	55%	690	1,008	68%	0	690	68%	0	690	68%
Screenline Total	6,310	9,649	65%	*7,895*	*9,810*	80%	*0*	*7,895*	*80%*	*0*	*7,895*	*80%*
Southeast												
Third Street	1,025	3,808	27%	2,422	5,712	42%	215	2,637	46%	152	2,574	45%
Mission	2,155	2,632	82%	3,117	3,008	**104%**	0	3,117	**104%**	0	3,117	**104%**
San Bruno/Bayshore	1,867	2,197	85%	1,952	2,197	**89%**	0	1,952	**89%**	0	1,952	**89%**
Other lines	1,466	1,756	83%	1,795	2,027	**89%**	81	1,876	**93%**	101	1,896	**94%**
Screenline Total	6,513	10,393	63%	*9,286*	*12,944*	72%	*296*	*9,582*	*74%*	*253*	*9,539*	*74%*

Table 4.E.25 Continued

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Southwest												
Subway lines	6,783	7,020	97%	6,314	7,020	**90%**	323	6,637	**95%**	410	6,724	**96%**
Haight/Noriega	1,178	1,596	74%	1,415	1,596	**89%**	0	1,415	**89%**	0	1,415	**89%**
Other lines	474	560	85%	175	560	31%	0	175	31%	0	175	31%
Screenline Total	8,435	9,176	**92%**	*7,904*	*9,176*	**86%**	*323*	*8,227*	***90%***	*410*	*8,314*	***91%***
Muni Screenlines Total	24,352	33,515	73%	*33,237*	*43,188*	*77%*	*673*	*33,910*	*79%*	*700*	*33,937*	*79%*
Individual Routes												
22 Fillmore IB	501	882	57%	539	882	61%	163	702	80%	129	668	76%
22 Fillmore OB	340	882	39%	455	882	52%	245	700	79%	350	805	**91%**
48 Quintara / 24th Street IB	119	252	47%	95	252	38%	149	244	**97%**	118	213	85%
48 Quintara / 24th Street OB	199	252	79%	244	252	**97%**	224	468	**186%**	319	563	**223%**
T Third IB	1,097	3,808	29%	1,554	5,712	27%	323	1,877	33%	410	1,964	34%
T Third OB	1,931	3,808	51%	3,327	5,712	58%	215	3,542	62%	152	3,479	61%

Note:

Bold indicates capacity utilization of 85 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

Table 4.E.26: Muni Downtown Screenlines – Cumulative Conditions P.M. Peak Hour

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast												
Kearny/Stockton	2,444	3,327	73%	6,295	8,329	76%	0	6,295	76%	0	6,295	76%
Other lines	903	1,155	78%	1,229	2,065	60%	71	1,300	63%	51	1,280	62%
Screenline Total	*3,347*	*4,482*	*75%*	*7,524*	*10,394*	*72%*	*71*	*7,595*	*73%*	*51*	*7,575*	*73%*
Northwest												
Geary	2,913	3,621	80%	2,996	3,621	83%	0	2,996	83%	0	2,996	83%
California	1,349	1,752	77%	1,766	2,021	**87%**	0	1,766	**87%**	0	1,766	**87%**
Sutter/Clement	523	630	83%	749	756	**99%**	0	749	**99%**	0	749	**99%**
Fulton/Hayes	1,544	1,838	84%	1,762	1,878	**94%**	0	1,762	**94%**	0	1,762	**94%**
Balboa	537	974	55%	776	974	80%	0	776	80%	0	776	80%
Screenline Total	6,866	8,815	78%	*8,049*	*9,250*	**87%**	*0*	*8,049*	***87%***	*0*	*8,049*	***87%***
Southeast												
Third Street	1,836	3,808	48%	2,300	5,712	40%	280	2,580	45%	208	2,508	44%
Mission	1,927	2,632	73%	2,673	3,008	**89%**	0	2,673	**89%**	0	2,673	**89%**
San Bruno/Bayshore	1,761	2,134	83%	1,817	2,134	**85%**	0	1,817	**85%**	0	1,817	**85%**
Other lines	1,213	1,675	72%	1,582	1,927	82%	76	1,658	**86%**	87	1,669	**87%**
Screenline Total	*6,737*	*10,249*	*66%*	*8,372*	*12,781*	66%	*356*	*8,728*	*68%*	*295*	*8,667*	*68%*

Table 4.E.26 Continued

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Southwest												
Subway lines	5,433	6,804	80%	5,692	6,804	84%	304	5,996	**88%**	354	6,046	**89%**
Haight/Noriega	1,065	1,596	67%	1,265	1,596	79%	0	1,265	79%	0	1,265	79%
Other lines	655	840	78%	380	840	45%	0	380	45%	0	380	45%
Screenline Total	*7,153*	*9,240*	*77%*	*7,337*	*9,240*	79%	*304*	*7,641*	*83%*	*354*	*7,691*	*83%*
Muni Screenlines Total	*24,103*	*32,786*	*74%*	*31,282*	*41,665*	75%	*731*	*32,013*	*77%*	*700*	*31,982*	*77%*
Individual Routes												
22 Fillmore IB	436	939	46%	549	939	58%	230	779	83%	301	850	**91%**
22 Fillmore OB	400	939	43%	512	939	55%	213	725	77%	177	689	73%
48 Quintara / 24th Street IB	160	252	63%	184	252	73%	211	395	**157%**	274	458	**182%**
48 Quintara / 24th Street OB	213	252	85%	175	252	69%	196	371	**147%**	161	336	**133%**
T Third IB	1,940	3,808	51%	3,758	5,712	66%	280	4,038	71%	208	3,966	69%
T Third OB	1,742	3,808	46%	2,219	5,712	39%	304	2,523	44%	354	2,573	45%

Note:

Bold indicates capacity utilization of 85 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

Mitigation Measure M-C-TR-4A: Increase capacity on the 48 Quintara/24th Street bus route under the Maximum Residential Scenario.

The project sponsors shall contribute funds for one additional vehicle (in addition to and separate from the four prescribed under Mitigation Measure M-TR-5 for the Maximum Residential Scenario) to reduce the Proposed Project's contribution to the significant cumulative impact to not cumulatively considerable. This shall be considered the Proposed Project's fair share toward mitigating this significant cumulative impact. If SFMTA adopts a strategy to increase capacity along this route that does not involve purchasing and operating additional vehicles, the Proposed Project's fair share contribution shall remain the same, and may be used for one of those other strategies deemed desirable by SFMTA.

The Proposed Project would also cause the 22 Fillmore bus route to exceed 85 percent utilization in the Maximum Commercial Scenario during the a.m. and p.m. peak hours. The Proposed Project would contribute 43 percent of the ridership on this bus route in the a.m. peak hour (outbound direction) and 35 percent of the ridership in the p.m. peak hour (inbound direction). This would be a considerable contribution to a significant cumulative impact on individual transit routes.

Therefore, additional mitigation would be necessary for the Maximum Commercial Scenario to reduce the considerable contribution to the significant cumulative impact on Muni service on this route.

Mitigation Measure M-C-TR-4B: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario.

The project sponsors shall contribute funds for two additional vehicles to reduce the Proposed Project's contribution to the significant cumulative impact to not considerable. This shall be considered the Proposed Project's fair share toward mitigating this cumulative impact. If SFMTA adopts an alternate strategy to increase capacity along this route that does not involve purchasing and operating additional vehicles, the Proposed Project's fair share contribution shall remain the same, and may be used for one of those other strategies deemed desirable by SFMTA.

However, as with Mitigation Measure M-TR-5, because SFMTA cannot commit funding to operate additional buses on these routes, to expand bus zones, or to increase transit vehicle travel speeds until environmental review of the selected elements is complete, the implementation of Mitigation Measures M-C-TR-4A and M-C-TR-4B is uncertain, and the Proposed Project's contribution to the significant cumulative impact would remain significant and unavoidable under both project scenarios.

Impact C-TR-5: The Proposed Project would not contribute considerably to a significant cumulative impact on the T Third Muni line. (*Less than Significant*)

The T Third Muni Metro line would operate below its utilization threshold in the a.m. and p.m. peak hours under both cumulative scenarios (Maximum Residential and Maximum Commercial). Therefore, the Proposed Project would not contribute considerably to a significant cumulative impact on this transit line and its cumulative impact would be less than significant. No mitigation is necessary.

Impact C-TR-6: The Proposed Project would not contribute considerably to significant cumulative impacts at Muni Downtown screenlines. (*Less than Significant*)

The Northeast and Southeast Muni Downtown screenlines would operate below the 85 percent capacity utilization threshold under future 2040 Cumulative conditions in both the a.m. and p.m. peak hours. The Northwest Downtown screenline would operate below the 85 percent capacity utilization threshold under future 2040 Cumulative conditions in the a.m. peak hour. The Southwest Downtown screenline would operate below the 85 percent capacity utilization threshold under future 2040 Cumulative conditions in the p.m. peak hour. Cumulative impacts to these screenlines would be less than significant.

The Southwest Downtown screenline would operate above the 85 percent threshold in the a.m. peak hour both with and without the Proposed Project in year 2040. However, even with the Proposed Project (under either the Maximum Residential or Maximum Commercial scenario), the capacity utilization would be lower than the Baseline Condition, and therefore, considered a less-than-significant cumulative impact.

The Northwest Downtown screenline would operate above the 85 percent threshold in the p.m. peak hour without the Proposed Project, resulting in a significant cumulative impact. Because the Proposed Project is estimated to contribute no riders to this screenline, the Proposed Project would not contribute considerably to the significant cumulative impact. No mitigation is required.

Impact C-TR-7: The Proposed Project would not contribute considerably to significant cumulative impacts on regional transit routes. (*Less than Significant*)

As shown in Table 4.E.27: Regional Transit Screenlines – Cumulative Conditions (A.M. Peak Hour) and Table 4.E.28: Regional Transit Screenlines – Cumulative Conditions (P.M. Peak Hour), no regional providers are expected to exceed their established capacity utilization thresholds. Therefore, there would be no significant cumulative impacts on regional transit service. No mitigation is required.

Table 4.E.27: Regional Transit Screenlines – Cumulative Conditions (A.M. Peak Hour)

Regional Screenline	Baseline Conditions (Inbound)			Cumulative Conditions (Inbound)			Cumulative Plus Project Conditions (Inbound) – Residential			Cumulative Plus Project Conditions (Inbound) – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay												
BART	28,000	25,680	109%	38,000	32,100	**118%**	137	38,137	**119%**	177	38,177	**119%**
AC Transit	1,596	2,829	56%	7,000	12,000	58%	16	7,016	58%	21	7,021	59%
Ferries	810	1,170	70%	4,682	5,940	79%	8	4,690	79%	10	4,692	79%
Screenline Total	*30,414*	*29,679*	*102%*	*49,682*	*50,040*	*99%*	*161*	*49,843*	*100%*	*208*	*49,890*	*100%*
North Bay												
Golden Gate Transit Bus	1,344	2,543	53%	1,990	2,543	78%	66	2,056	81%	80	2,070	81%
Ferries	1,088	1,959	56%	1,619	1,959	83%	0	1,619	83%	0	1,619	83%
Screenline Total	*2,432*	*4,502*	*54%*	*3,609*	*4,502*	*80%*	*66*	*3,675*	*82%*	*80*	*3,689*	*82%*
South Bay												
BART	16,000	21,400	75%	21,000	28,808	73%	53	21,053	73%	61	21,061	73%
Caltrain	2,258	3,100	73%	2,310	3,600	64%	435	2,745	76%	516	2,826	79%
SamTrans	266	520	51%	271	520	52%	11	282	54%	12	283	54%
Ferries	-	-	-	59	200	30%	0	59	30%	0	59	30%
Screenline Total	*18,524*	*25,020*	*74%*	*23,640*	*33,128*	*71%*	*499*	*24,139*	*73%*	*589*	*24,229*	*73%*
Regional Screenlines Total	*51,370*	*59,201*	*87%*	*76,931*	*87,670*	*88%*	*726*	*77,657*	*89%*	*877*	*77,808*	*89%*

Note:

Bold indicates capacity utilization of 100 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

Table 4.E.28: Regional Transit Screenlines – Cumulative Conditions (P.M. Peak Hour)

Regional Screenline	Baseline Conditions (Outbound)			Cumulative Conditions (Outbound)			Cumulative Plus Project Conditions (Outbound) – Residential			Cumulative Plus Project Conditions (Outbound) – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay												
BART	27,000	25,680	105%	36,000	32,100	**112%**	119	36,119	**113%**	89	36,089	**112%**
AC Transit	2,297	3,926	59%	7,000	12,000	58%	14	7,014	58%	11	7,011	58%
Ferries	813	1,615	50%	5,319	5,940	90%	7	5,326	90%	5	5,324	90%
Screenline Total	*30,110*	*31,221*	*96%*	*48,319*	*50,040*	*97%*	140	48,459	*97%*	105	48,424	*97%*
North Bay												
Golden Gate Transit Bus	1,399	2,817	50%	2,070	2,817	73%	57	2,127	76%	41	2,111	75%
Ferries	973	1,959	50%	1,619	1,959	83%	0	1,619	83%	0	1,619	83%
Screenline Total	*2,372*	*4,776*	*50%*	*3,689*	*4,776*	*77%*	57	3,746	*78%*	41	3,730	*78%*
South Bay												
BART	15,000	21,400	70%	20,000	28,808	69%	46	20,046	70%	31	20,031	70%
Caltrain	2,472	3,100	80%	2,529	3,600	70%	379	2,908	81%	261	2,790	78%
SamTrans	147	320	46%	150	320	47%	9	159	50%	6	156	49%
Ferries	-	-	-	59	200	30%	0	59	30%	0	59	30%
Screenline Total	*17,619*	*24,820*	*71%*	*22,738*	*32,928*	*69%*	434	23,172	*70%*	298	23,036	*70%*
Regional Screenlines Total	*50,101*	*60,817*	*82%*	*74,746*	*87,744*	*85%*	631	75,377	*86%*	444	75,190	*86%*

Note:

Bold indicates capacity utilization of 100 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2016. See Appendix D in the Transportation Impact Study for Transit Line Capacity Calculations.

Maximum Residential Scenario

The Maximum Residential Scenario would contribute 161 transit riders from the East Bay, 66 riders from the North Bay, and 499 riders from the South Bay in the inbound direction in the a.m. peak hour. In the outbound direction in the p.m. peak hour, the Proposed Project would contribute 140 riders to the East Bay, 57 riders to the North Bay, and 434 riders to the South Bay. Although the BART line within the East Bay regional screenline would exceed the capacity utilization threshold in the a.m. and p.m. peak hours, the additional riders from the Proposed Project would not contribute considerably to a significant cumulative impact because the regional screenlines would operate within established capacity utilization thresholds. No mitigation is required.

Maximum Commercial Scenario

The Maximum Commercial Scenario would contribute 208 transit riders from the East Bay, 80 transit riders from the North Bay, and 589 transit riders from the South Bay in the inbound direction in the a.m. peak hour. In the outbound direction in the p.m. peak hour, the Proposed Project would contribute 105 transit riders to the East Bay, 41 transit riders to the North Bay, and 298 transit riders to the South Bay. Although the BART line within the East Bay regional screenline would exceed the capacity utilization threshold in the a.m. and p.m. peak hours, the Proposed Project's additional riders would not contribute considerably to a significant cumulative impact because the regional screenlines would operate within established capacity utilization thresholds. No mitigation is required.

CUMULATIVE PEDESTRIAN, BICYCLE AND LOADING CONDITIONS

Impact C-TR-8: The Proposed Project would not contribute considerably to significant cumulative pedestrian impacts. (*Less than Significant*)

On-site pedestrian circulation is, by its nature, site-specific, and a project generally would not contribute to cumulative impacts from other development projects. Although the Proposed Project is expected to increase both pedestrian and vehicle travel in the area, the existing local roadways are generally designed to adopted design standards, which are developed to ensure the safe circulation for all modes, including conflicts between pedestrians and other modes. Therefore, there would be no significant cumulative pedestrian impacts in the study area. As indicated in the "Pedestrian Impacts" discussion, pp. 4.E.96-4.E.100, pedestrian travel from the Proposed Project would not result in overcrowding of crosswalks or sidewalks. Therefore, the Proposed Project would not contribute to significant cumulative impacts on pedestrian travel. No mitigation is necessary.

Impact C-TR-9: The Proposed Project would not contribute considerably to a significant cumulative bicycle impact. (*Less than Significant*)

Bicycle trips are expected to increase on the project site and in the vicinity of the project site in the future as a result of the Proposed Project, as well as overall growth in the Eastern Neighborhoods and Mission Bay, and growth elsewhere in the City. The increases in traffic predicted to result from the Proposed Project could result in an increase in vehicle-bicycle conflicts at intersections in the transportation study area. The Proposed Project would not create hazardous conditions for bicycles or otherwise interfere with bicycle access to the project site or surrounding areas, and would provide new bicycle facilities on the project site. Therefore, the Proposed Project would not contribute considerably to a significant cumulative bicycle impact. No mitigation is necessary.

Impact C-TR-10: The Proposed Project would not contribute to a significant cumulative loading impact. (*Less than Significant*)

Loading impacts are by their nature localized and site-specific. The Proposed Project would result in a significant loading impact based on the shortfall in on-street and off-street loading facilities proposed compared to the demand, as explained in Impact TR-12; however, the shortfall on the project site would not be expected to contribute to any loading impacts from other development projects near the project site. Overall, because loading tends to occur as close to the delivery point as possible, particularly in cases where loading occurs via double-parking, as may be the case within the project site, it is not expected that unmet loading demand associated with the Proposed Project would be accommodated outside of the project site. Similarly, it is not likely that unmet loading demand from past, present, and reasonably foreseeable development in other parts of the study area would substantially interfere with travel on or near the project site. Therefore, cumulative loading impacts would not be significant. Although the Proposed Project itself would have a significant project-related loading impact, it would not contribute to a significant cumulative loading impact and the impact would be less than significant.

CUMULATIVE EMERGENCY VEHICLE ACCESS

Impact C-TR-11: The Proposed Project would not contribute considerably to a significant cumulative impact on emergency vehicle access. (*Less than Significant*)

The Proposed Project would not contribute considerably to cumulative emergency vehicle access conditions in the area. With implementation of the Proposed Project, emergency vehicle access to the project site would remain essentially unchanged from existing conditions, except for the addition of the 21st Street connection with Illinois Street. With implementation of transit-only lanes and changes to the number and direction of travel lanes on streets in the vicinity of the Proposed Project, emergency vehicle providers may adjust travel routes to respond to incidents;

however, emergency vehicle access in the area would not be substantially affected. Emergency vehicles would be permitted full use of transit-only lanes and would not be subject to any turn restrictions.

With the addition of the Warriors Arena, just to the north of the project site, there will be additional periods of congestion in the area, to which the Proposed Project will contribute traffic. However, the Warriors Arena operators are required to provide comprehensive event transportation management strategies to reduce the overall effect of event-related congestion on bicycles, pedestrians, transit, and emergency vehicle operations. Additionally, although not required to address a significant project-related impact, Improvement Measure I-TR-C would require the project's TDM coordinator, or other designee, to participate in the Mission Bay Ballpark Transportation Coordination Committee (MBBTCC) to ensure that events at AT&T Park, the Warriors Arena, Pier 70, and other sites in the study area are coordinated insofar as feasible, and efforts can be made to avoid overlapping events.

Therefore, for the above reasons, the Proposed Project, in combination with past, present, and reasonably foreseeable development in San Francisco, would result in less-than-significant cumulative emergency vehicle access impacts.

PARKING INFORMATION

As discussed in Section 4.A, Introduction to Chapter 4, on pp. 4.A.3-4.A.5, SB 743 amended CEQA by adding Public Resources Code Section 21099 regarding analysis of parking impacts for urban infill projects in transit priority areas. Public Resources Code Section 21099(d), effective January 1, 2014, provides, in part, that ". . .parking impacts of a residential, mixed-use residential, or employment center project on an infill site located within a transit priority area shall not be considered significant impacts on the environment." The Proposed Project meets each of the three criteria: it is in a transit priority area because it is located within 0.5 mile of a major transit stop; it is on an infill site because it is located on a developed site in an urban area; it is a mixed-use residential project; and it would be an employment center proposed to provide space for approximately 5,600 to approximately 9,770 jobs and located in a transit priority area on an already developed site zoned for commercial uses. Therefore, this EIR does not consider parking in determining the significance of project impacts.

However, the Planning Department acknowledges that parking conditions may be of interest to the public and decision-makers. Additionally, even with adoption of SB 743, secondary physical impacts of parking shortages need to be addressed. Therefore, this parking discussion is presented below to identify whether there would be any secondary physical impacts associated with a constrained parking supply, such as queuing that would affect the public rights-of-way by drivers waiting for scarce parking.

Existing Parking Conditions

Based on information from *SFPark*, an SFMTA program, and surveys conducted by Fehr & Peers in September 2013, there are approximately 2,410 on-street parking spaces in the three-block radius around the project site, bounded by Mariposa Street, Indiana Street, 25th Street, and the Bay. On-street parking is available on most block faces in this area, but not along parts of Mariposa Street, Third Street, Illinois Street, and other nearby streets. Most of the on-street parking is unmetered and unrestricted. Residential permit parking (RPP) area "X" is designated along the west side of Minnesota Street (from 20th Street to 22nd Street), the east side of Minnesota Street (from 18th Street to Tubbs Street), the west side of Tennessee Street (from 19th Street to Tubbs Street), and the east side of Tennessee Street (from 20th Street to Tubbs Street). Over 80 percent of the on-street public parking spaces were occupied during the mid-day period (1:30 p.m. to 3:00 p.m.) and nearly 70 percent was occupied in the evening (6:30 p.m. to 8:00 p.m.).

There are no public, general-use off-street parking lots in the survey area. There are some lots for permit holders or customers of adjacent businesses. The public parking lot at the corner of Illinois and 20th streets would be removed as part of the Proposed Project and therefore was not included in the data about existing parking conditions.

Proposed Project Parking Information

The Proposed Project would provide 0.75 parking spaces per residential unit, and one space per 1,000 square feet of gross floor area for office/commercial uses and for RALI uses. The maximum amount of off-street parking that would be provided is 3,370 spaces for the Maximum Residential Scenario and 3,496 spaces for the Maximum Commercial Scenario. The Proposed Project would provide for approximately 285 on-street parking spaces along most of the streets internal to the project site (a net increase of 228 on-street spaces). The Maximum Residential Scenario would generate a peak demand for approximately 7,078 parking spaces and the Maximum Commercial Scenario would generate a peak demand for approximately 7,633 parking spaces. Thus, the estimated supply would not accommodate all of the Proposed Project's parking demand.

The lack of parking may result in motorists looking for parking outside of the project site. However, there is an existing RPP area along Minnesota and Tennessee streets in the vicinity, and a new RPP area is proposed for the Dogpatch area that is closer to the project site. These features would discourage spillover parking from the Proposed Project, and would thereby eliminate project-related secondary effects of parking shortfalls. Parking management programs for events held at the project site would be developed as part of the overall event-specific TDM Plans to be completed as part of the permitting process for those events. The extent to which event-specific

parking shortfalls may affect the neighborhood is not likely to be more severe than existing conditions and, in fact, may be less due to the smaller size of events anticipated at the project site than the large events (up to 40,000 attendees) that occasionally occur under existing conditions.

Some drivers would shift to public transit or other modes of travel such as bicycling, use carshare facilities when a vehicle is needed, and/or would not own a car. It is possible that such a shift from automobile use to transit would add an unknown amount of additional demand to public transit facilities. The impacts of project-related transit ridership have been addressed earlier in this document. To the extent more riders use transit than forecasted due to parking shortfalls on the site, mitigation measures for project transit impacts are generally to be implemented based on ongoing monitoring. Thus, mitigation measures will be implemented based on actual observed conditions and not forecasted conditions.

F. NOISE AND VIBRATION

Section 4.F, Noise and Vibration, describes the existing noise environment in the project area, evaluates the potential construction-related and operational noise and vibration impacts associated with implementation of the Proposed Project, assesses the noise compatibility of proposed uses with the existing and future noise environment, and identifies mitigation measures to avoid or reduce potential adverse impacts. This section summarizes the information provided in the *Pier 70 Mixed-Use District Project, Noise Technical Memorandum.*[1]

ENVIRONMENTAL SETTING

SOUND FUNDAMENTALS

Sound is characterized by various parameters that describe the rate of oscillation (frequency) of sound waves, the distance between successive troughs or crests in the wave, the speed that it travels, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. Except in carefully controlled laboratory experiments, a change of only 1 dBA in sound level cannot be perceived. Outside of the laboratory, a 3-dBA change is considered a perceptible difference. A 10-dBA increase in the level of a continuous noise represents a perceived doubling of loudness.[2]

Noise Descriptors

Noise is generally defined as sound that is loud, disagreeable, unexpected or unwanted. Sound is mechanical energy transmitted in the form of a wave by a disturbance or vibration that causes pressure variation in air detectable by the human ear. Variations in noise exposure over time are typically expressed in terms of a steady-state energy level (called L_{eq}) that represents the

[1] Orion Environmental Associates, *Pier 70 Mixed-Use District Project, Noise Technical Memorandum,* December 2016.

[2] California Department of Transportation (Caltrans), *Technical Noise Supplement (TeNS) to the Traffic Noise Analysis Protocol* pp. 2-44 to 2-45, September 2013. Available online at http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf. Accessed April 14, 2015.

acoustical energy of a given measurement, or alternatively as a statistical description of what sound level is exceeded over some fraction (10, 50 or 90 percent) of a given observation period (i.e., L_{10}, L_{50}, L_{90}). Leq (24) is the steady-state acoustical energy level measured over a 24-hour period. Lmax is the maximum, instantaneous noise level registered during a measurement period. Because residential receptors are more sensitive to unwanted noise intrusion during the evening and at night, State law requires for planning purposes that an artificial dBA increment be added to evening and nighttime noise levels to form a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). CNEL adds a 5-dBA penalty during the evening (7:00 p.m. to 10:00 p.m.) and a 10-dBA penalty at night (10:00 p.m. to 7:00 a.m.). Another 24-hour noise descriptor, called the day-night noise level (Ldn), is similar to CNEL. Both CNEL and Ldn add a 10-dBA penalty to all nighttime noise levels between 10:00 p.m. and 7:00 a.m., but Ldn does not add the evening 5-dBA penalty between 7:00 p.m. and 10:00 p.m. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location from transportation noise sources.[3] Table 4.F.1: Representative Environmental Noise Levels, presents representative noise sources and their corresponding noise levels in dBA at varying distances from the noise sources.

Noise from Multiple Sources

Since sound pressure levels in decibels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. Adding a new noise source to an existing noise source, both producing noise at the same level, will not double the noise level. Table 4.F.2: Rules for Combining Sound Levels by "Decibel Addition," demonstrates the result of adding noise from multiple sources.

If the difference between two noise sources is 10 dBA or more, the higher noise source will dominate and the resultant noise level will be equal to the noise level of the higher noise source. In general, if the difference between two noise sources is 0 to 1 dBA, the resultant noise level will be 3 dBA higher than the higher noise source, or both sources if they are equal. If the difference between two noise sources is 2 to 3 dBA, the resultant noise level will be 2 dBA above the higher noise source. If the difference between two noise sources is 4 to 10 dBA, the resultant noise level will be 1 dBA higher than the higher noise source.

[3] Ibid. pp. 2-48.

Table 4.F.1: Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 100 feet		
	100	
Gas Lawnmower at 3 feet		
	90	
Diesel Truck going 50 mph at 50 feet		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noise Urban Area during Daytime		
Gas Lawnmower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Area during Daytime	50	Dishwasher in Next Room
Quiet Urban Area during Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	30	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
	0	

Source: California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, p. 2-20, September 2013

Table 4.F.2: Rules for Combining Sound Levels by "Decibel Addition"[1]

When two decibel values differ by	Add the following amount to the higher decibel value	Example
0 to 1 dB	3 dB	60 dB + 61 dB = 64 dB
2 to 3 dB	2 dB	60 dB + 63 dB = 65 dB
4 to 9 dB	1 dB	60 dB +69 dB = 70 dB
10 dB or more	0 dB	60 dB + 75 dB = 75 dB

Note:
[1] This methodology provides an estimate of the resulting sound level and is accurate to ±1 decibel.

Source: Orion Environmental Associates, 2016

Attenuation of Noise

A receptor's distance from a noise source affects how noise levels attenuate (decrease). Transportation noise sources tend to be arranged linearly such that roadway traffic attenuates at a rate of 3.0 dBA to 4.5 dBA per doubling of distance from the source, depending on the intervening surface (paved or vegetated, respectively). Point sources of noise, such as stationary equipment or construction equipment, typically attenuate at a rate of 6.0 dBA to 7.5 dBA per doubling of distance from the source.[4] For example, a sound level of 80 dBA at 50 feet from the noise source will be reduced to 74 dBA at 100 feet, 68 dBA at 200 feet, and so on. Noise levels can also be attenuated by "shielding" or providing a barrier between the source and the receptor. With respect to interior noise levels, noise attenuation effectiveness depends on whether windows are closed or open. Based on the U.S. Environmental Protection Agency's (USEPA) national average, closed windows reduce noise levels by approximately 25 dBA, while open windows reduce noise levels by about 15 dBA.[5]

Health Effects of Environmental Noise

The World Health Organization (WHO) is perhaps the best source of current knowledge regarding health impacts of noise. According to WHO, sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA (L_{eq}) or when intermittent interior noise levels reach or exceed 45 dBA (L_{max}), particularly if background noise is low. With a bedroom

[4] The 1.5-dBA variation in attenuation rate (6 dBA vs. 7.5 dBA) can result from ground-absorption effects, which occur as sound travels over soft surfaces such as soft earth or vegetation (7.5 dBA attenuation rate) versus hard ground such as pavement or very hard-packed earth (6 dBA rate) (U.S. Housing and Urban Development, *The Noise Guidebook*, 1985, p. 24. Available online at https://www.hudexchange.info/onecpd/assets/File/Noise-Guidebook-Chapter-4.pdf. Accessed April 14, 2015.

[5] U.S. EPA, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, Appendix B, Table B-4, p. B-6, March 1974.

window slightly open (a reduction from outside to inside of 15 dB), the WHO criteria would suggest exterior continuous (ambient) nighttime noise levels should be 45 dBA (L_{eq}) or below, and short-term events should not generate noise in excess of 60 dBA (L_{max}). WHO also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective for the ability to fall asleep.[6]

Other potential health effects of noise identified by WHO include decreased performance on complex cognitive tasks, such as reading, attention, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (again, generally after long-term occupational exposure, or shorter-term exposure to very high noise levels, for example, exposure several times a year to a concert with noise levels at 100 dBA). Noise can also disrupt speech intelligibility at relatively low levels; for example, in a classroom setting, a noise level as low as 35 dBA can disrupt clear understanding. Finally, noise can cause annoyance and can trigger emotional reactions like anger, depression, and anxiety. WHO reports that during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA, or moderately annoyed by activities with noise levels below 50 dBA.

Vehicle traffic and continuous sources of machinery and mechanical noise contribute to ambient noise levels. Short-term noise sources, such as large vehicle audible warnings, the crashing of material being loaded or unloaded, car doors slamming, and engines revving, contribute very little to 24-hour noise levels but are capable of causing sleep disturbance and severe annoyance. The importance of noise to receptors depends on both time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels at night can disturb sleep.

Vibration and Groundborne Noise

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Vibration is typically measured by peak particle velocity (PPV) in inches per second (in/sec). With the exception of long-term occupational exposure, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. People may tolerate infrequent, short-duration vibration levels, but human annoyance to vibration becomes more pronounced if the vibration is continuous or occurs frequently. High levels of vibration can damage fragile buildings or interfere with

[6] World Health Organization, *Guidelines for Community Noise*, Chapter 3, p. 46, April 1999. Available online at http://www.who.int/docstore/peh/noise/guidelines2.html. Accessed November 18, 2015.

sensitive equipment. Depending on the age of the structure and type of vibration (transient, continuous, or frequent intermittent sources), vibration levels as low as 0.5 to 2.0 in/sec PPV can damage a structure.[7]

Typical sources of groundborne vibration in San Francisco are large-scale construction projects that involve pile driving or underground tunneling. Vibration is also caused by operation of transit vehicles in the subway system under Market Street, including Muni Metro light rail vehicles and heavy rail Bay Area Rapid Transit (BART) trains. In general, such vibration is only an issue when sensitive receptors are located in close proximity. Since rubber tires provide vibration isolation, rubber tire vehicles such as Muni buses, trucks, and automobiles rarely create substantial groundborne vibration effects unless there is a discontinuity or bump in the road that causes the vibration.[8]

EXISTING CONDITIONS

Noise

The Pier 70 Mixed-Use District project site is bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. The project site is located in an urban area where noise from nearby industrial uses (including the BAE Systems Ship Repair facility to the north, the American Industrial Center [AIC] to the west, and PG&E Potrero Substation to the south) and vehicular traffic (automobiles, trucks, and buses on the I-280 freeway and other streets in the vicinity) dominate the existing ambient noise environment. In addition, intermittent sources of noise that contribute to ambient noise levels include distant commuter train traffic (Caltrain) approximately 0.25 mile to the west and nearby light rail trains (Third Street line) approximately 365 feet west of the Proposed Project's western boundary. More distant intermittent noise sources include activities such as concerts and sporting events at AT&T Ballpark, which is located 1.25 miles north of the site. Principal noise sources in the immediate project vicinity are described as follows:

- **BAE Systems Ship Repair Facility.** The BAE Systems Ship Repair facility is located to the north of the project site. The short-term measurements at the ship repair docks reveal that the general noise character of the ship repair work is discontinuous and episodic, but also generally broadband and without substantial tonality. The lack of strong tonality results in the noise being perceived as less annoying than a similar noise level from a tonal source, such as a transformer or chiller. The fire pump at the western end of the

[7] California Department of Transportation (Caltrans), *Transportation and Construction Vibration Guidance Manual*, September 2013, Table 9, p. 23. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed on December 16, 2016.

[8] Federal Transit Administration (FTA), 2006, *Transit Noise and Vibration Impact Assessment,* DTA-VA-90-1003-06, p. 10-6, May 2006, U.S. Department of Transportation. Available online at http://www.fta.dot.gov/12347_2233.html. Accessed April 14, 2015.

dock runs continuously and has substantial tonality; however, the pump was not audible over the ambient conditions at any of the long-term measurement locations and, in fact, is barely detectable in the short-term measurement made nearby at the western end of the ship repair docks.

In the waterfront vicinity where there are no other buildings to block the line-of-sight from Dry Dock 2, more high-frequency energy from activities, such as water blasting or painting, is present and audible. Another mildly tonal source is the Aggreko generators located between Dry Dock 2 and Dock 4 East. These generators contribute substantial noise at the northern, central, and eastern portions of the 28-Acre Site. However, BAE has upgraded the electrical infrastructure at the shipyard, and these generators now operate only if a ship cannot connect to a line power or during a power outage.

- **American Industrial Center (AIC).** The AIC is located west of the Illinois Parcels on the west side of Illinois Street. AIC is located on Third Street between 20th and 23rd streets, and extends to Illinois Street. The facility comprises about 900,000 square feet of commercial, industrial, and related supporting uses. Currently, approximately 300 tenants engaged in various commercial and industrial activities lease space in the AIC. The facility houses breweries, commercial kitchens and bakeries, garment manufacturing businesses, warehouses, and distribution centers. On average, there are typically 2,500 to 3,000 people on the site at a given time.[9] AIC loading docks are located on Illinois Street, and noise from loading activities could cause noise disturbance along the western Illinois Parcels boundary, across Illinois Street.
- **PG&E Potrero Substation.** There is a PG&E substation located south of the Illinois Parcels (south of the project site), and it contains large transformers and related electrical equipment that are not enclosed. Transformer noise can be disturbing, because transformers generate tonal noise (i.e., noise with simple or pure tones or "hum" components). Field observations indicate that transformer noise is audible, but heavy equipment and traffic noise on local streets dominate the ambient noise environment in this area. This type of noise source could be annoying during the nighttime hours, if audible at future residences.
- **Nearby Sporting or Special Events.** Residents living along Illinois Street are and will be subject to short-term, intermittent increases in traffic noise before and after events held at the existing AT&T Park and proposed Warrior's arena. Since these increases only occur for a short time before and after a game, they do not substantially increase ambient noise levels. Even so, these short-term, intermittent increases are likely noticeable to residents living adjacent to Illinois Street.

Groundborne Noise and Vibration

Groundborne noise refers to a condition where noise is experienced inside a building or structure as a result of vibrations produced outside of the building and transmitted as ground vibration between the source and receiver. Groundborne noise can be a problem in situations where the primary

[9] Charles J. Higley, Farella Braun + Martel, LLP, *Pier 70 Mixed-Use District – EIR Scoping Comments*, June 5, 2015.

airborne noise path is blocked, such as in the case of a subway tunnel passing near homes or other noise-sensitive structures. There are no known sources of existing groundborne noise or vibration in the vicinity of the project site. Distant Caltrain traffic (approximately 0.25 mile to the west of the project site) and nearby light rail train operations (Third Street line, approximately 365 feet west of the Proposed Project's western boundary) both operate at the surface and generate airborne noise and surface vibration. Given their distance and surface location, these two sources are not considered to be substantial sources of groundborne noise or vibration for the 28-Acre Site or Illinois Parcels. There is no machinery or activities in the adjacent BAE site that would generate vibration on the 28-Acre Site or Illinois Parcels.[10]

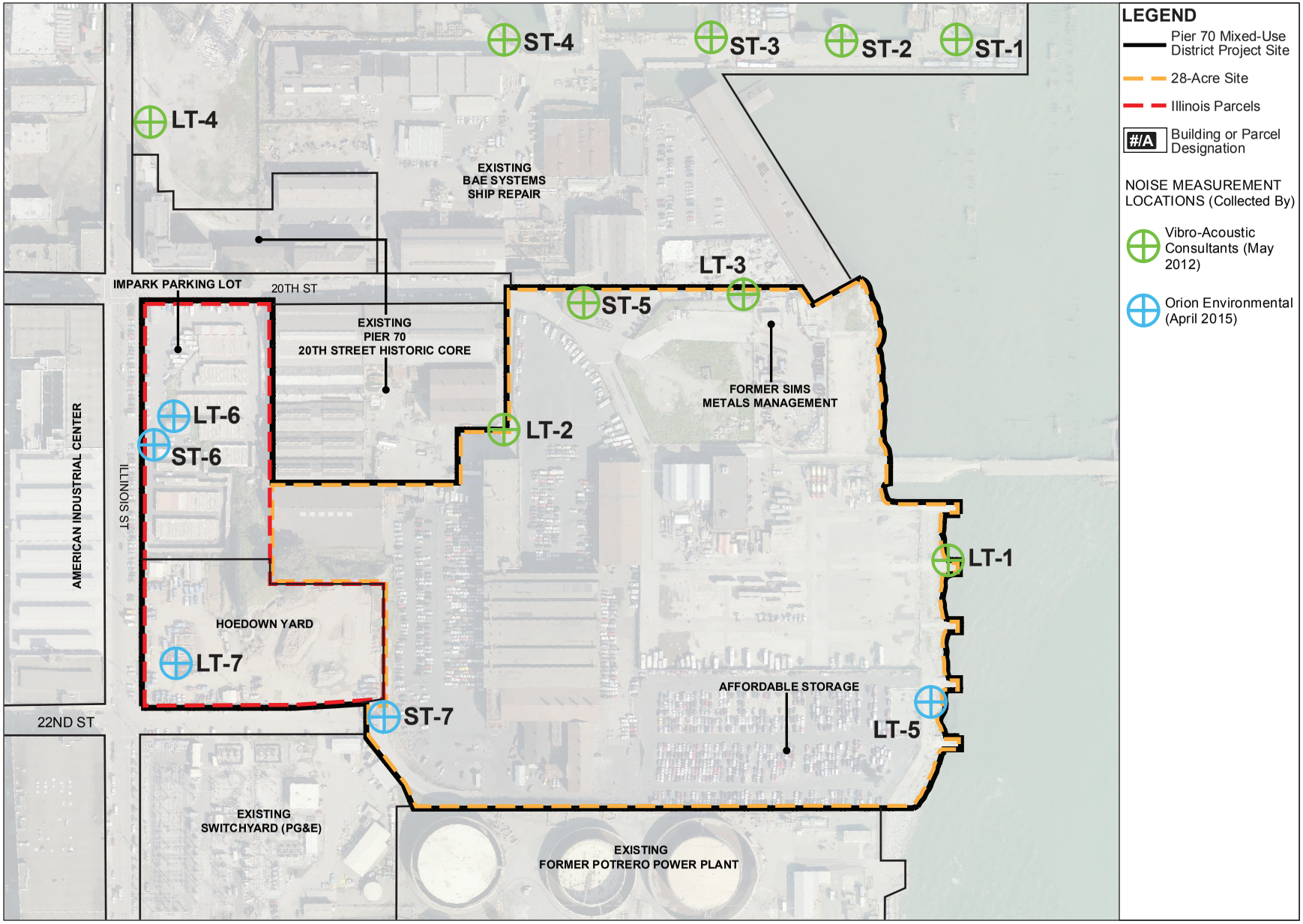
AMBIENT NOISE MEASUREMENTS

To characterize the background noise environment in the project vicinity, a total of 14 noise measurements were collected. Four long-term (96 hours) and five short-term (15 to 30 minutes) measurements were collected north of and in the northern portion of the project area over a 5-day period[11] in May 2012 in order to determine noise characteristics of the BAE Systems Ship Repair activities and their effect on the project site's noise environment. In addition, one long-term and two short-term measurements were collected in the southeastern, southern, and western margin of the project site for a 48-hour period in April and August 2015.[12] Measurement locations are indicated on Figure 4.F.1: Noise Measurement Locations.

[10] E-mail communication dated February 2, 2016 from Dennis Deisinger, BAE Systems Ship Repair, to David Beaupre, Port of San Francisco, regarding vibration sources at the BAE site that could cause vibration in areas outside of BAE's leasehold area.

[11] Two long-term measurements (LT-1 and LT-2) were collected by Vibro-Acoustic Consultants (VACC) in the central and eastern portions of the 28-Acre Site, one long-term measurement (LT-3) was taken near the northeastern boundary of the 28-Acre Site, and one long-term measurement (LT-4) was collected by VACC along Illinois Street (north of the Mixed-Use District project site) from May 11 to May 16, 2012 (96 hours). Five short-term measurements (ST-1 through ST-5, 15 to 30 minutes) were also conducted by VACC during this same period in the vicinity of the BAE Systems Ship Repair facility, which are located north of the Mixed-Use District project site (see Appendix F for noise measurement data). The complete VACC report is included in Attachment 1 of the *Pier 70 Mixed-Use District Project, Noise Technical Memorandum,* San Francisco, CA, Case No. 2014-001272ENV, by Orion Environmental Associates (December 2016).

[12] Three long-term measurements (LT-5, LT-6, and LT-7) were collected at the waterfront on the 28-Acre Site and along Illinois Street on the Illinois Parcels by Orion Environmental Associates in the southern portion of the Mixed-Use District project site, while short-term measurements (ST-6 and ST-7, 15 minutes) were taken along the southern and western boundaries of the Mixed-Use District project site in April and August 2015. Short-term measurements were taken with a Metrosonics Model db 308 sound level meter, while the long-term measurement was taken with a 3M SoundPro SE/DL Type 2 sound meter.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.F.1: NOISE MEASUREMENT LOCATIONS

Noise measurement data are included in Appendix C. A summary of noise measurement data is presented in Table 4.F.3: Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring on the Project Site and Vicinity. Since BAE is one of the primary sources of noise in the project vicinity, the frequency and tonal characteristics of the shipyard noise were also measured as part of short-term measurements and included in Appendix C.

When noise measurements were taken in 2012, BAE was repairing a cruise ship. When this occurs, ship repair activities occur 24 hours per day, 7 days a week. Since maximum BAE operations occurred during this measurement period, these measurements are considered the worst-case, maximum background ambient noise level (including operation of generators). Subsequent to the 2012 measurements, BAE completed an electrical upgrade, which allows docking ships to connect to line power instead of Aggreko electric power generators. These generators are located between Dry Dock 2 and Dock 4 East and can also be located on docking ships near the exhaust stack. While this upgrade reduced 2012 noise levels in the northern margin of the project site most of the time, these generators still operate on a short-term basis during power outages and if a ship cannot connect to line power.[13] Therefore, the 2012 measurements conservatively represent maximum noise levels generated at the BAE site.

Sims Metals Management (SMM) was also operating in 2012 but has since closed. In 2012, it operated in the northeastern portion of the project site every day of the 2012 measurement period except Sunday. Since SMM no longer operates on-site, the noise levels measured on Sunday, May 13, 2012 (when SMM was not operating) are considered to reflect the existing ambient noise environment in the project vicinity. The 0 to 2 dBA difference in L_{dn} between Sunday and average noise levels at the three long-term measurement locations in the vicinity of SMM is not considered a substantial difference.

When noise measurements were taken in 2015, there were intermittent noise sources observed during measurements. The BAE Systems Ship Repair facility typically operates during the daytime hours only, but an undocking operation occurred, which appeared to raise nighttime noise levels for a short time by 5 to 10 decibels, resulting in a minor increase in the 24-hour L_{dn} of 2 dBA.

[13] E-mail communication with David Beaupre, Port of San Francisco, on September 8, 2015, regarding the status of the electrical upgrade project and operation of Aggreko generators at the BAE site.

Table 4.F.3: Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring on the Project Site and Vicinity (dBA)

Measurement Location	Time Period	Average L_{dn} or L_{eq}	Primary Noise Sources
LT-1: Eastern boundary of 28-Acre Site on the waterfront, south of Pier 64, between Slips 5 and 6 (minimum of 1,100 feet south of BAE Site)	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	69 dBA (L_{dn}) 66 dBA (L_{dn})[1] 64 dBA (L_{dn}) 64 dBA (L_{dn}) **66 dBA (L_{dn})**	BAE ship repair activities occurred days, nights, and weekends (24/7) during measurement period and were audible above background ambient noise levels during site visit. Large trucks and buses were observed during site visit and may have operated in parking lot near the meter.
LT-2: Center of 28-Acre Site at north façade of Building 2	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	67 dBA (L_{dn}) 65 dBA (L_{dn})[1] 65 dBA (L_{dn}) 67 dBA (L_{dn}) **66 dBA (L_{dn})**	Ambient noise dominated by traffic in the distance and local industrial activity; BAE ship repair activities audible; and the hum tone from some lighting ballasts at the roof of Building 2 were very noisy, but did not affect noise measurement results.
LT-3: Northeast boundary of 28-Acre Site southeast of Building 6 (minimum of 500 feet south of BAE Site)	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	62 dBA (L_{dn}) 60 dBA (L_{dn}) 61 dBA (L_{dn}) 63 dBA (L_{dn}) **62 dBA (L_{dn})**	Adjacent to Sims Metal Management (SMM), which was operating in 2012 but has since closed. Since SMM was closed on Sunday, 5/13/12, this level is more representative of the existing noise environment when cruise ship repair activities occur. Historic Building 6 helps block ship repair noise from this location and would continue to do so with the project.
LT-4: East of Illinois Street, north of project site, in tow yard just north of Building 103	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	61 dBA (L_{dn}) 61 dBA (L_{dn}) 63 dBA (L_{dn}) 63 dBA (L_{dn}) **62 dBA (L_{dn})**	Construction of the residential development at 820 Illinois occurred directly across Illinois Street and these activities occurred every day except Sunday. Ship repair activities were not audible at this location during the site visit.
LT-5: Southeastern boundary of 28-Acre Site on the waterfront, south of Pier 64 at Slip 8	Thursday, 4/2/15: Friday, 4/3/15: **Average:**	57 dBA (L_{dn}) 59 dBA (L_{dn}) **58 dBA (L_{dn})**	Traffic and construction activities at Affordable Storage occurred near meter. Military ship (in for repair at BAE Site) was moved from Drydock 2 to Berth 4-East around midnight.[2]

Table 4.F.3 Continued

Measurement Location	Time Period	Average L_{dn} or L_{eq}	Primary Noise Sources
LT-6: North-central portion of Illinois Parcels, east of Illinois Street, about 110 feet east of the centerline at ImPark parking lot	Tuesday, 8/18/15 Thursday, 8/19/15 **Average:**	64 dBA (L_{dn}) 64 dBA (L_{dn}) **64 dBA (L_{dn})**	Traffic on Illinois Street (including construction haul trucks); cars parking in ImPark lot; traffic/activities at AIC to the west across Illinois Street.
LT-7: Southwest portion of Illinois Parcels in Hoedown Yard, 110 feet from Illinois Street	Tuesday, 8/18/15 Daytime, 8/18/15 Wednesday, 8/19/15 Daytime, 8/19/15 **Average:**	67 dBA (L_{dn}) 63 dBA (L_{eq}) 68 dBA (L_{dn}) 66 dBA (L_{eq}) **68 dBA (L_{dn})**	Heavy equipment at Hoedown Yard; Potrero Substation hum; traffic on Illinois and 22nd streets; AIC activities to the west across Illinois Street.
ST-1: North of project site at BAE Site, at Dry Dock 2	Thursday, 5/1712, 11:00 a.m. to noon (15–30 minutes)	77 dBA (L_{eq})	Cruise ship repair activities, including nights and weekends.
ST-2: North of project site at BAE Site, West of Dry Dock 2	Thursday, 5/17/12, 11:00 a.m. to noon (15–30 minutes)	81 dBA (L_{eq})	Aggreko electric power generators operating 30 feet away.
ST-3: North of project site at BAE Site at Dock 4 East	Thursday, 5/17/12, 11:00 a.m. to noon (15–30 minutes)	76 dBA (L_{eq})	Military ship repair activities.
ST-4: North of project site at BAE Site at the western end of repair facilities	Thursday, 5/17/12, 11:00 a.m. to noon (15–30 minutes)	66 dBA (L_{eq}); 77 dBA (L_{eq})	Ship repair activities at west end of ship repair docks, fire pump (runs continuously).
ST-5: Northern boundary of 28-Acre Site adjacent to 20th Street at southern façade of BAE Site boiler building	Thursday, 5/17/12, 11:00 a.m. to noon (15–30 minutes)	76 dBA (L_{eq})[1]	BAE Site boiler facilities.
ST-6: West side of Illinois Parcels, about 50 feet east of the Illinois Street centerline	Wednesday, 4/1/15 11:30 a.m. to 11:45 a.m. (15 minutes)	64 dBA (L_{eq})	Traffic on Illinois Street, including construction haul trucks; heavy equipment operating to the south (in Hoedown Yard) was audible during measurement.

Table 4.F.3 Continued

Measurement Location	Time Period	Average L_{dn} or L_{eq}	Primary Noise Sources
ST-7: Southern boundary of project site, adjacent to 22nd Street at gate, 550 feet from Illinois Street	Wednesday, 4/1/15 noon to 12:15 p.m. (15 minutes)	58 dBA (L_{eq})	Heavy equipment at Hoedown Yard, Potrero Substation hum, and traffic on 22nd Street were audible.

Notes: Maximum BAE Site operations (24/7) occurred during measurement of LT-1 through LT-4 and therefore these measurements are considered the worst-case, maximum background ambient noise levels. No nighttime ship repair activities occurred during the LT-5 measurement period, but an undocking operation occurred around midnight on Friday, 4/3/15.

[1] During the 2012 measurement period, Sims Metals Management (SMM) operated in the northern portion of the project site every day except Sunday. Since SMM no longer operates on-site, the noise levels measured on Sunday, May 13, 2012 (when SMM was not operating) are considered to reflect the existing ambient noise environment in the project vicinity.

[2] E-mail communication from Gerry Roybal, Maritime Marketing Manager, Port of San Francisco, on April 15, 2015.

Sources: VACC, 2012 (LT-1 through LT-4 and ST-1 through ST-5); Orion Environmental Associates, 2015 (LT-5, LT-6, LT-7, ST-6, and ST-7)

A comparison of 2015 nighttime noise measurements collected along the western boundary of the Illinois Parcels (Location LT-6, which is 700 feet north of Potrero Substation and 110 feet from the centerline of Illinois Street, and Location LT-7, which is 200 feet from Potrero Substation and 110 feet from the centerline of Illinois Street) indicate that as much as 10 to 13 dBA (L_{eq}) of the nighttime ambient noise levels could be attributable to noise generated by Potrero Substation.

Both short-term and long-term noise measurements taken along Illinois Street in 2012 and 2015 were affected by construction-related truck traffic traveling on Illinois Street, current activities at the PG&E Hoedown Yard (southwest corner of the Illinois Parcel), and construction of a multi-family development (820 Illinois Street) northwest of the site.

In the project vicinity, the primary sources of noise are the BAE Systems Ship Repair facility, various industrial activities (AIC Industrial Center, PG&E Hoedown Yard, and Potrero Substation facilities), new development-related construction activities along Illinois Street, traffic on local streets in the project vicinity (Illinois Street, 20th Street, and 22nd Street), and the distant I-280 freeway. Noise measurements indicate that noise levels in the project area averaged 66 dBA (L_{dn}, ranging between 60 and 70 dBA [L_{dn}]) when nighttime ship repair activities occur, and averaged 60 dBA [L_{dn}]) or 6 dBA less when nighttime repair activities do not occur.[14]

[14] LT-1 is located approximately 1,100 feet from the BAE Systems Ship Repair facility, while LT-5 is located approximately 1,400 feet from these repair facilities. When adjusted for this difference in distance (difference of 2 dB), nighttime noise levels at approximately 1,100 feet from the dry docks (LT-1) ranged from 57-61 dBA (L_{eq}) or 66 dBA (L_{dn}) with nighttime ship repair activities and 50-55 dBA (L_{eq}) or 60 dBA (L_{dn}) without nighttime ship repair activities.

Sensitive Receptors

Some land uses (and associated users) are considered more sensitive to ambient noise levels than others due to the types of activities typically involved with the land use and the amount of noise exposure (in terms of both exposure duration and insulation from noise). In general, occupants of residences, schools, daycare centers, hospitals, places of worship, and nursing homes are considered to be sensitive receptors (i.e., persons who are sensitive to noise based on their specific activities, age, health, etc.). There are industrial, commercial, and residential uses in the project site vicinity. Existing noise-sensitive receptors in the project vicinity (within 900 feet of the project site) include residences and schools, as listed below in Table 4.F.4: Sensitive Receptors in the Project Vicinity, and their locations are indicated in Figure 4.F.2: Noise-Sensitive Receptors in the Project Vicinity, p. 4.F.16. The UCSF Mission Bay Hospital (1825 Fourth Street) is located approximately 0.3 mile to the north. Also, there are additional planned residential developments in the project vicinity, which are also listed in Table 4.F.4. There are no skilled nursing facilities, churches, or public libraries in the immediate project vicinity.

REGULATORY FRAMEWORK

FEDERAL REGULATIONS

In 1972, the Noise Control Act (42 United States Code [U.S.C.] Section 4901 et seq.) was passed by Congress to promote noise environments in support of public health and welfare. It also established the USEPA Office of Noise Abatement and Control to coordinate Federal noise control activities. USEPA established guidelines for noise levels that would be considered safe for community exposure without the risk of adverse health or welfare effects. USEPA found that to prevent hearing loss over the lifetime of a receptor, the yearly average L_{eq} should not exceed 70 dBA, and the L_{dn} should not exceed 55 dBA in outdoor activity areas or 45 dBA indoors to prevent interference and annoyance.[15] In 1982, USEPA phased out the office's funding as part of a shift in Federal noise control policy to transfer the primary responsibility of regulating noise to State and local governments.

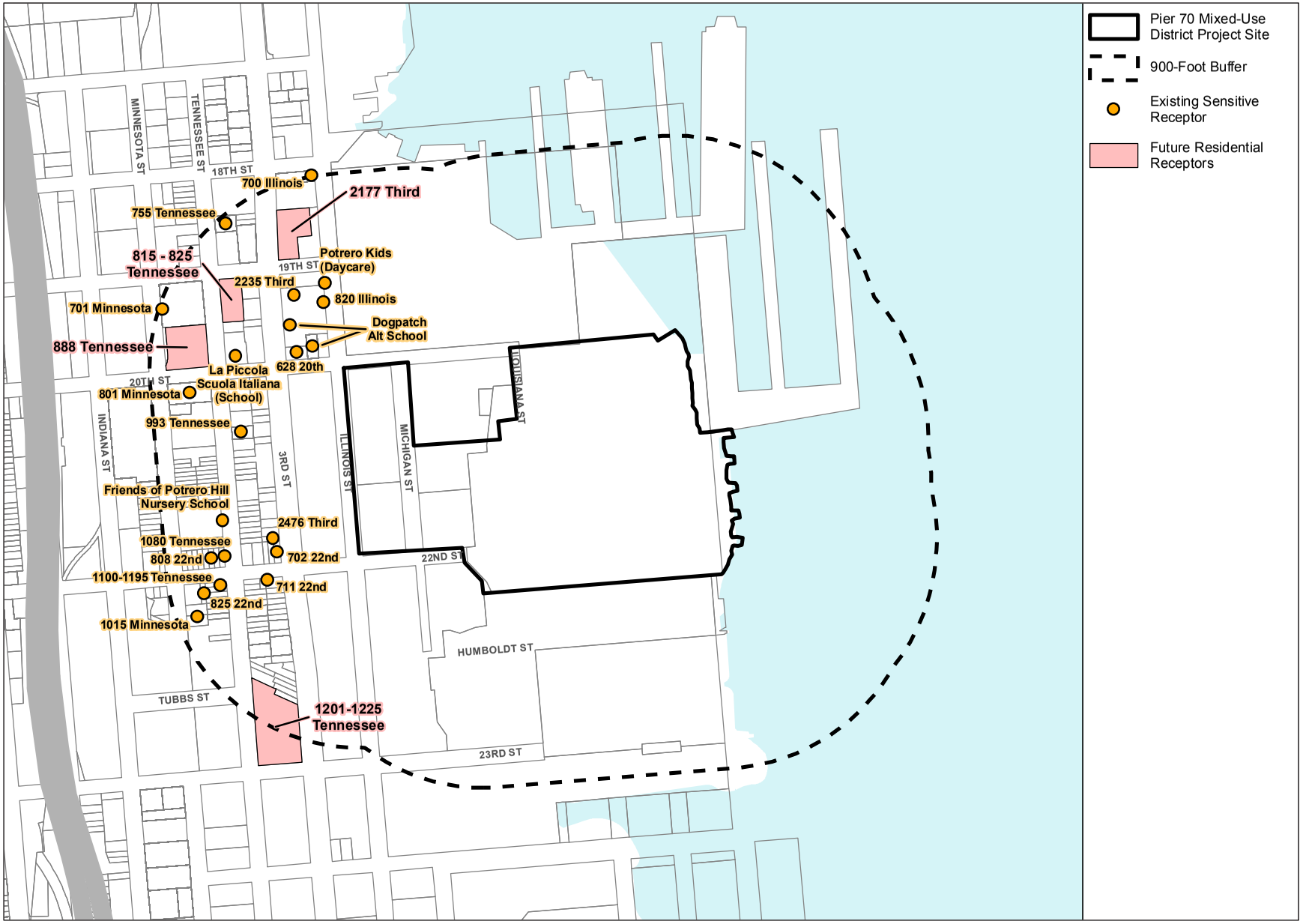
Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under Title 40 of the Code of Federal Regulations, Part 205, Subpart B. The Federal truck passby noise standard is 80 dBA at 50 feet from the vehicle pathway centerline, under specified test procedures. These requirements are implemented through regulatory controls on truck manufacturers. There are no comparable standards for vibration, which tend to be specific to the roadway surface, the vehicle load, and other factors.

[15] U.S. Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974.

Table 4.F.4. Sensitive Receptors in the Project Vicinity

Type of Sensitive Receptor	Address	Minimum Distance from Site
EXISTING SENSITIVE RECEPTORS WITHIN 900 FEET OF PROJECT SITE		
North of 20th Street (Northwest of Project Site)		
Dogpatch Alternative School (Site 2)	616 20th Street	140 feet
Residential	628 20th Street	190 feet
Potrero Kids (Daycare)	810 Illinois Street	350 feet
Residential	820 Illinois Street	200 feet
Residential	2235 Third Street	375 feet
Residential	993 Tennessee Street	460 feet (approx.)
La Piccola Scuola Italiana (School)	728 20th Street	470 feet (approx.)
Residential	700 Illinois Street	770 feet
Residential	755 Tennessee Street	825 feet
Residential	701 Minnesota Street	700 feet
Between 20th and 22nd Streets (West of Project Site)		
Dogpatch Alternative School	2265 Third Street	250 feet
Residential	2476-2478 Third Street	370 feet
Residential	702-718 22nd Street	375-430 feet
Residential	1080 Tennessee Street	630 feet
Friends of Potrero Hill Nursery School	1060A Tennessee Street	630 feet
Residential	808-840 22nd Street	690-780 feet
Residential	801-976 Minnesota Street	650-915 feet
South of 22nd Street (Southwest of Project Site)		
Residential	711 22nd Street	380 feet
Residential	1100-1195 Tennessee Street	500 feet
Residential	825-829 22nd Street	700 feet
Residential	1015 Minnesota Street	750 feet
FUTURE/PLANNED RESIDENTIAL RECEPTORS WITHIN 900 FEET OF PROJECT SITE		
North of 20th Street (North or Northwest of Project Site)		
Residential (Mixed)	815 Tennessee Street	525 feet
Residential (Mixed)	2177 Third Street	700 feet
Residential (Mixed)	888 Tennessee Street	650 feet
South of 22nd Street (Southwest of Project Site)		
Residential (Mixed)	1201-1225 Tennessee Street	780 feet

Source: Google Earth (Imagery Date 4/5/2016) for parcel data (land use, address, and distance to the site); Baseline and Cumulative Projects List in Section 4.A, Introduction to Chapter 4, of this EIR, pp. 4.A.5-4.A.11



Source: SWCA/Turnstone (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.F.2: NOISE-SENSITIVE RECEPTORS IN THE PROJECT VICINITY

STATE REGULATIONS

Noise

With respect to noise insulation standards, the 2013 California Building Code (Title 24, Part 2 of the California Code of Regulations [CCR]) requires that walls and floor/ceiling assemblies separating dwelling units from each other or from public or service areas have a Sound Transmission Class (STC) of at least 50, meaning they can reduce noise by a minimum of 50 dB.[16] The Green Building Code standards (Section 1207.4, Allowable Interior Noise Levels) also specify a maximum interior noise limit of 45 dBA (L_{dn} or CNEL) in habitable rooms, and require that common interior walls and floor/ceiling assemblies meet a minimum STC rating of 50 for airborne noise.

The 2013 Green Building Standards Code (also part of the State Building Code; CCR Title 24, Part 11, and referenced below as the more commonly known "Title 24") specifies the following insulation standards for Environmental Comfort (Section 5.507) to minimize exterior noise transmission into interior spaces for non-residential buildings:

- Section 5.507.4.1, Exterior Noise Transmission, requires wall and roof-ceiling assemblies to have an STC of at least 50 and exterior windows to have a minimum STC of 30 for any of the following building locations: (1) within the 65-dBA, L_{dn}, noise contour of a freeway, expressway, railroad, or industrial source; and (2) within the 65-dBA noise contour of an airport. Exceptions include buildings with few or no occupants and where occupants are not likely to be affected by exterior noise, such as factories, stadiums, parking structures, and storage or utility buildings. Section 5.507.4.1.1 requires non-residential buildings to be designed with exterior walls and roof-ceiling assemblies with an STC rating of 45 to provide an acceptable interior noise level of 50 dBA, Leq, in occupied areas during any hour of operation.[17]
- 5.507.4.3, Interior Sound Transmission, requires wall and floor-ceiling assemblies separating tenant spaces and also separating tenant spaces and public places to have an STC of at least 40.
- 5.507.4.2, Interior Sound, requires wall and floor-ceiling assemblies separating tenant spaces and separating tenant spaces and public places to have an STC of at least 40.

San Francisco has adopted the Green Building Code; it is enforced by the Department of Building Inspection.

[16] State Building Code Section 1207.2.
[17] California Building Standards Commission and International Code Council, *Guide to the 2013 California Green Building Standards Code (Nonresidential), Cal Green, Section 5.507, Environmental Comfort,* pp. 95-97, February 2014.

Vibration

To assess the damage potential to structures from ground vibration induced by construction equipment, various vibration criteria were reviewed and synthesized by Caltrans and they are presented in Table 4.F.5: Vibration Guidelines for Potential Damage to Structures. As indicated in this table, the threshold for continuous vibration sources is about half of the threshold for transient sources.

Table 4.F.5: Vibration Guidelines for Potential Damage to Structures

Structure Type and Condition	Maximum Peak Particle Velocity (in/sec, PPV)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Notes: Transient sources create a single, isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013, Table 19, p. 27. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed onDecember 16, 2016.

People are more sensitive to vibration during the nighttime hours when sleeping than during daytime waking hours. Numerous studies have been conducted to characterize the human response to vibration. As shown in Table 4.F.6: Vibration Guidelines for Annoyance, for steady-state (continuous) vibration, human response is typically “strongly perceptible” at 0.1 in/sec PPV, “distinctly perceptible” at 0.035 in/sec PPV, and “barely perceptible” at 0.01 in/sec PPV.

LOCAL REGULATIONS AND GUIDELINES

San Francisco Police Code

In the City, regulation of noise is addressed in Article 29 of the Police Code (the Noise Ordinance or Police Code), which states the City’s policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power. Section 2900 makes the following declaration with regard to community noise levels: “It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce

Table 4.F.6: Vibration Guidelines for Annoyance

Human Response	Maximum Peak Particle Velocity (in/sec, PPV)	
	Transient Sources[1]	Continuous/Frequent Intermittent Sources[2]
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.10

Notes:

in/sec = inches per second; PPV = peak particle velocity

[1] Transient sources create a single, isolated vibration event, such as blasting or drop balls.

[2] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013, Table 20, p. 38. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed on December 16, 2016.

noise levels, through all practicable means, in those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization's Guidelines on Community Noise."

Sections 2907 and 2908 of Article 29 regulate construction equipment and construction work at night, while Section 2909 provides for limits on stationary-source noise from machinery and equipment. Sections 2907 and 2908 are enforced by the Department of Building Inspection, and Section 2909 is enforced by the Department of Public Health. Summaries of these and other relevant sections are presented below.

Section 2907(a) of the Police Code limits noise from construction equipment to 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance. Exemptions to this requirement include impact tools with approved mufflers, pavement breakers, and jackhammers with approved acoustic shields, and construction equipment used in connection with emergency work. Section 2908 prohibits nighttime construction (between 8:00 p.m. and 7:00 a.m.) that generates noise exceeding the ambient noise level by 5 dBA at the nearest property line unless a special permit has been issued by the City.

Section 2909 generally prohibits fixed mechanical equipment noise and music in excess of 5 dBA more than ambient noise from residential sources, 8 dBA more than ambient noise from commercial sources, and 10 dBA more than ambient on public property at a distance of 25 feet or more. Section 2909(d) establishes maximum noise levels for fixed noise sources (e.g., mechanical equipment) of 55 dBA (7:00 a.m. to 10:00 p.m.) and 45 dBA (10:00 p.m. to 7:00

a.m.) inside any sleeping or living room in any dwelling unit located on residential property to prevent sleep disturbance, with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

The City's *Guidelines for Noise Control Ordinance Monitoring and Enforcement*, revised in December 2014, clarifies the definition of "ambient" as the L_{90} (the level of noise exceeded 90 percent of the time), and this noise descriptor is considered to be a conservative representation of the ambient under most conditions.[18] Ordinance compliance is determined by measuring the L_{90} for 10 minutes, with and without the noise source at issue. Use of the L_{90} descriptor is appropriate when determining code compliance of a fixed noise source (such as mechanical equipment), but is not appropriate for other aspects of a CEQA noise impact analysis, which determines noise compatibility based on L_{dn} or CNEL, a different noise descriptor (as described above under "Sound Fundamentals," p. 4.F.1).

Use of Sound Amplifying Equipment

As discussed below under Project Features, the Proposed Project includes open space that would be programmed for various special events, some of which may include amplified sound and, therefore, may require a permit from the Entertainment Commission. Article 1, Section 47.2 of the Police Code regulates the use of any sound amplifying equipment, whether truck-mounted or otherwise, within the City and County of San Francisco and consists of the following regulations:

1. The only sounds permitted are music or human speech.

2. Hours of operation permitted shall be between 9:00 a.m. and 10:00 p.m.; operation after 10:00 p.m. is permitted only at the location of a public event or affair of general public interest or as otherwise permitted by the Entertainment Commission.

3. Except as permitted by the Entertainment Commission, sound shall not be issued within 450 feet of hospitals, schools, churches, courthouses, public libraries, or mortuaries.

4. No sound truck with its amplifying device in operation shall traverse any one block in the City and County more than four times in any one calendar day.

5. Amplified human speech and music shall not be unreasonably loud, raucous, jarring, or disturbing to persons of normal sensitiveness within the area of audibility, nor louder than permitted in Subsections (6) and (7) hereof.

[18] City and County of San Francisco, San Francisco Police Code, Article 29: Regulation of Noise Guidelines for Noise Control Ordinance Monitoring and Enforcement, December 2014 Guidance (Supersedes All Previous Guidance), December 2014. Available online at https://www.sfdph.org/dph/files/EHSdocs/ehsNoise/GuidelinesNoiseEnforcement.pdf. Accessed April 22, 2015.

6. When the sound truck is in motion, the volume of sound shall be controlled so that it will not be audible for a distance in excess of 450 feet from its source; provided, however, that when the sound truck is stopped by traffic, the said sound amplifying equipment shall not be operated for longer than one minute at such a stop.

7. Except as permitted by the Entertainment Commission for public gatherings, in all cases where sound amplifying equipment remains at one location or when the sound truck is not in motion, the volume of sound shall be controlled so that it will not be audible for a distance in excess of 250 feet from the periphery of the attendant audience.

8. No sound amplifying equipment shall be operated unless the axis of the center of any sound reproducing equipment used shall be parallel to the direction of travel of the sound truck; provided, however, that any sound reproducing equipment may be so placed upon said sound truck as to not vary more than 15 degrees on either side of the axis of the center of the direction of travel and, provided further, that radial, nondirectional type of loudspeakers may be used on said sound trucks either alone or in conjunction with sound reproducing equipment placed within 15 degrees of the center line of the direction of travel.

San Francisco Entertainment Commission Permits

Section 90.1 of the San Francisco Administrative Code establishes the role of the San Francisco Entertainment Commission to regulate, promote and enhance the field of entertainment in San Francisco. The seven-member commission has powers to accept, review, and gather information to conduct hearings for entertainment-related permit applications and rule upon and issue, deny, condition, suspend, revoke or transfer entertainment-related permits in accordance with applicable laws and regulations. Additionally, the Entertainment Commission plans and coordinates the provision of City services for major events for which there is no recognized organizer, promoter, or sponsor.

Pursuant to Section 1060.1 of the Police Code, the Entertainment Commission has permit authority over a variety of different permit types including Place of Entertainment permits, Outdoor Amplified Sound/Loudspeaker permits, and Limited Live Performance permits. Permit hearings require the applicant to provide proof of neighborhood outreach to the Commission. Such outreach must consist of at least two of four types of outreach: (1) presentation to a neighborhood, community or residential group; (2) presentation to the leadership of a local not-for-profit that deals with community support such as housing, at risk youth, health, or mental services; (3) a petition including an appropriate number of neighbor signatures according to the applicants business address; and/or (4) presentation to a business association if no community organization or not-for-profit exists near the venue.

San Francisco General Plan

The Environmental Protection Element of the *San Francisco General Plan* (*General Plan*) contains Land Use Compatibility Guidelines for Community Noise for determining the compatibility of various land uses with different noise levels (see Figure 4.F.3: San Francisco Land Use Compatibility Chart for Community Noise). These guidelines, which are similar to State guidelines set forth by the Governor's Office of Planning and Research, indicate maximum acceptable noise levels for various land uses. Although this figure presents a range of noise levels that are considered compatible or incompatible with various land uses, the maximum "satisfactory" noise level is 60 dBA (L_{dn}) for residential and hotel uses; 65 dBA (L_{dn}) for school classrooms, libraries, churches, and hospitals; 70 dBA (L_{dn}) for playgrounds, parks, office uses, retail commercial uses, and noise-sensitive manufacturing/communications uses; and 77 dBA (L_{dn}) for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications, and utilities. If these uses are proposed to be located in areas with noise levels that exceed these guidelines, a detailed analysis of noise reduction requirements is normally necessary for each building or group of buildings prior to final review and approval.

Objectives and policies in the Environmental Protection Element that pertain to the Proposed Project include the following:

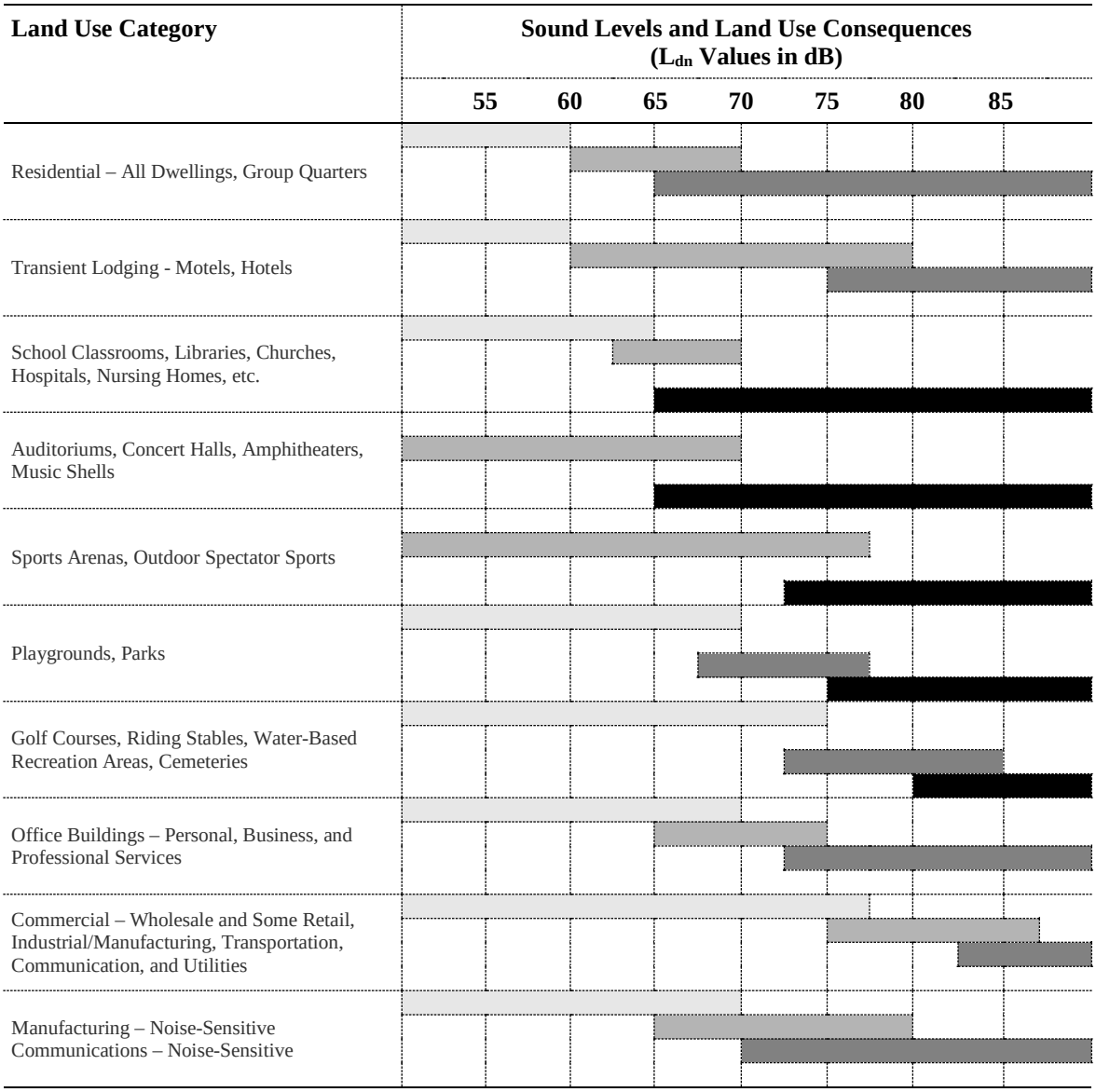
Policy 9.2: Impose traffic restrictions to reduce transportation noise. Transportation noise levels vary according to the predominance of vehicle type, traffic volume, and traffic speed. Curtailing any of these variables ordinarily produces a drop in noise level. In addition to setting the speed limit, the City has the authority to restrict traffic on city streets, and it has done so on a number of streets. In addition, certain movement restraints can be applied to slow down traffic or divert it to other streets. These measures should be employed where appropriate to reduce noise.

Policy 9.6: Discourage changes in streets which will result in greater traffic noise in noise-sensitive areas. Widening streets for additional traffic lanes or converting streets to one-way direction can induce higher traffic volume and faster speeds. Other techniques such as tow-away lanes and traffic light synchronization also facilitate heavier traffic flows. Such changes should not be undertaken on residential streets if they will produce an excessive rise in the noise level of those streets.

Objective 10: Minimize the impact of noise on affected areas. The process of blocking excessive noise from our ears could involve extensive capital investment if undertaken on a systematic, citywide scale. Selective efforts, however, especially for new construction, are both desirable and justified.

Policy 10.1: Promote site planning, building orientation and design, and interior layout that will lessen noise intrusion. Because sound levels drop as distance from the source increases, building setbacks can play an important role in reducing noise for the building occupants. (Of course,

Figure 4.F.3: San Francisco Land Use Compatibility Chart for Community Noise



Satisfactory, with no special noise insulation requirements. Noise levels in this range are considered "Acceptable."

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Noise levels in this range are considered "Conditionally Acceptable."

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Noise levels in this range are considered "Conditionally Unacceptable."

New construction or development should generally not be undertaken. Noise levels in this range are considered "Unacceptable."

Source: San Francisco Planning Department, 1996. *San Francisco General Plan*, adopted on June 27, 1996. Available online at http://www.sf-planning.org/ftp/General_Plan/I6_Environmental_Protection.htm#ENV_TRA_11. Accessed March 12, 2015.

if provision of the setback eliminates livable rear yard space, the value of the setback must be weighed against the loss of the rear yard.) Buildings sited with their narrower dimensions facing the noise source and sited to shield or be shielded by other buildings also help reduce noise intrusion.

Although walls with no windows or small windows cut down on noise from exterior sources, in most cases it would not be feasible or desirable to eliminate wall openings. However, interior layout can achieve similar results by locating rooms whose use require more quiet, such as bedrooms, away from the street noise. In its role of reviewing project plans and informally offering professional advice on site development, the Department of City Planning can suggest ways to help protect the occupants from outside noise, consistent with the nature of the project and size and shape of the building site.

Policy 10.2: Promote the incorporation of noise insulation materials in new construction. State-imposed noise insulation standards apply to all new residential structures except detached single-family dwellings. Protection against exterior noise and noise within a building is also important in many nonresidential structures. Builders should be encouraged to take into account prevailing noise levels and to include noise insulation materials as needed to provide adequate insulation.

Policy 10.3: Construct physical barriers to reduce noise transmission from heavy traffic carriers. If designed properly, physical barriers such as walls and berms along transportation routes can in some instances effectively cut down on the noise that reaches the areas beyond. There are opportunities for a certain amount of barrier construction, especially along limited access thoroughfares and transit rights-of-way (such as BART), but it is unlikely that such barriers can be erected along existing arterial streets in the city. Barriers are least effective for those hillside areas above the noise source. Where feasible, appropriate noise barriers should be constructed.

Objective 11: Promote land uses that are compatible with various transportation noise levels. Because transportation noise is going to remain a problem for many years to come, attention must be given to the activities close to the noise. In general, the most noise-sensitive activities or land uses should ideally be the farthest removed from the noisy transportation facilities. Conversely, those activities that are not seriously affected by high outside noise levels can be located near these facilities.

Central Waterfront Plan

Objective 1.5: Minimize the impact of noise on affected areas and ensure general plan noise requirements are met.

Noise, or unwanted sound, is an inherent component of urban living. While environmental noise can pose a threat to mental and physical health, potential health impacts can be avoided or reduced through sound land use planning. The careful analysis and siting of new land uses can help to ensure land use compatibility, particularly in zones which allow a diverse range of land uses.

Traffic is the most important source of environmental noise in San Francisco. Commercial land uses also generate noise from mechanical ventilation and cooling systems, and through freight movement. Sound control technologies are available to both insulate sensitive uses and contain unwanted sound. The use of good urban design can help to ensure that noise does not impede access and enjoyment of public space.

Policy 1.5.1: Reduce potential land use conflicts by providing accurate background noise-level data for planning.

Policy 1.5.2: Reduce potential land use conflicts by carefully considering the location and design of both noise generating uses and sensitive uses in the Central Waterfront.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant noise or vibration impact. The Proposed Project would have a significant impact related to noise and vibration if it were to:

F.1 Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

F.2 Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

F.3 Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

F.4 Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

F.5 Be located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, resulting in exposure to excessive noise levels for people residing or working in the area.

F.6 Be located within the vicinity of a private airstrip, resulting in the exposure to excessive noise levels for people residing or working in the project area.

F.7 Be substantially affected by existing noise levels.

The project site is not within an airport land use plan area, nor is it within 2 miles of a public airport or public use airport or in the vicinity of a private airstrip. Therefore, criteria F.5 and F.6 are not applicable, and are not discussed further in the impacts evaluation, below.

APPROACH TO ANALYSIS

Noise

Project implementation would result in operation of heavy equipment on the project site for demolition of existing structures, construction of new structures, and rehabilitation of on-site structures to be retained. Construction activities would occur intermittently on the project site over the 11-year construction duration and could expose nearby sensitive receptors to temporary increases in noise levels substantially in excess of ambient levels. Project construction would also result in temporary increases in truck traffic noise along haul routes for off-hauling excavated materials and materials deliveries. To assess potential construction noise impacts, sensitive receptors and their relative exposure were identified and described. When determining exposure to noise, consideration was given to factors such as structural barriers and distance because of their ability to attenuate noise.

Operation of on-site equipment expected to be used in project construction were estimated based on equipment noise data published by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), as shown in Table 4.F.8: Typical Construction Noise Levels, p. 4.F.34. The sources assessed were identified by the project sponsors as likely equipment to be used during project construction. The roadway noise construction model of FHWA was then used to predict noise levels at the nearest receptors during both pile-driving activity and non-impact construction activity.

Methodology for Analysis of Construction Impacts

Construction-related noise impacts were assessed in part using FTA methodology for general quantitative noise assessment.[19] This methodology calls for estimating a combined noise level from simultaneous operation of the two noisiest pieces of equipment expected to be used in each construction phase. This method applies usage factors to each piece of equipment analyzed to account for the time that the equipment is in use over the specified time period. Given the size of the project site, the minimum distance between source and receptor was based on the distance between the closest boundary to the specified receptors.

Noise ordinances regulate noise sources under the control of local jurisdictions, such as mechanical equipment and amplified sounds, as well as prescribe hours of heavy equipment operation. Time and noise limits prescribed in Article 29 of the Police Code are used in this EIR as criteria to determine the significance of project impacts under CEQA in addition to

[19] U.S. Department of Transportation, Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment, Section 12.1.1 Quantitative Noise Assessment Methods*, May 2006, pp. 12-4 to 12-8. Available online at http://www.fta.dot.gov/12347_2233.html. Accessed on March 13, 2016.

consideration of other qualitative criteria such as the duration of noise and the proximity of sensitive receptors. Quantitative criteria that are used to determine the significance of construction-related noise increases under CEQA (including relevant sections of the San Francisco Noise Ordinance) are summarized as follows:

- **Construction Equipment Noise Thresholds.** Proposed construction activities would be required to comply with the San Francisco Noise Ordinance. Sections 2907 and 2908 of the San Francisco Noise Ordinance allows construction activities between 7:00 a.m. and 8:00 p.m., but limits noise from any individual piece of construction equipment, except impact tools approved by San Francisco Public Works, to 80 dBA at 100 feet, which is equivalent to 86 dBA at 50 feet. Construction noise impacts from non-impact equipment that comply with Section 2907(a) of the Noise Ordinance would be considered less than significant (Impact M-NO-1). If construction activities using non-impact equipment would exceed the Section 2907(a) standard, then the noise effects would be significant and mitigation measures would be required.
- **Construction Noise Thresholds at Sensitive Receptors.** The San Francisco Noise Ordinance does not identify quantitative noise limit standards for impact equipment or combined noise impacts from simultaneous operation of multiple pieces of equipment. Therefore, the significance of impact tool (including pile-driving noise) and combined noise increases from simultaneous operation of multiple pieces of construction equipment are evaluated at the closest sensitive receptors based on application of FTA guidelines, as described above (at residential uses, 90 dBA (L_{eq}) during the day and 80 dBA during the night because they are noise-sensitive). To determine whether the project would result in a significant impact with respect to temporary daytime increases in noise levels in the project vicinity above levels existing without the project, the Planning Department considers an increase of 10 dBA over existing noise levels ("Ambient+10 dBA" threshold) due to persistent construction, which generally represents a perceived doubling of loudness, to be a substantial temporary increase in noise levels.

Methodology for Analysis of Operational Impacts

Operation of the Proposed Project would result in permanent increases in ambient noise levels, primarily through project-related increases in traffic, addition of stationary equipment, and introduction of new uses, events, and activities on the project site. Operational noise issues evaluated in this section include: (1) noise increases resulting from the Proposed Project's stationary and mobile noise sources (Impacts NO-4 and NO-5 respectively); and (2) compatibility of the Proposed Project's noise-sensitive uses and existing uses in the project site vicinity with future noise levels at the project site, as defined by the San Francisco Land Use Compatibility Guidelines for Community Noise (Impact NO-6). Additionally, any operations or activities with the potential to cause sleep disturbance would also be considered a significant noise impact (Impacts NO-4 and NO-6). Traffic noise modeling was performed using the FHWA Traffic Noise (RD-77-108) Model. The significance of noise increases from operation of stationary equipment on the project site is assessed based on ordinance noise increase limits as specified below.

Traffic increases associated with the Proposed Project would result in traffic noise increases along local streets. In general, traffic noise increases of less than 3 dBA are barely perceptible to people, while a 5-dBA increase is readily noticeable.[20] Therefore, permanent increases in ambient noise levels of more than 5 dBA are considered to be unacceptable and a significant noise impact in any existing or resulting noise environment. However, in places where the existing or resulting noise environment is "Conditionally Acceptable," "Conditionally Unacceptable," or "Unacceptable" based on the San Francisco Land Use Compatibility Chart for Community Noise (Figure 4.F.3, p. 4.F.23), for sensitive noise receptors any noise increase greater than 3 dBA is considered a significant noise impact.

Traffic noise levels on 79 road segments in the Project vicinity were modeled using traffic volumes presented in the *Pier 70 Traffic Impact Study* (see Figure 4.E.1: Transportation Study Area and Study Intersections, in Section 4.E., Transportation and Circulation, p. 4.E.2).[21] In Table 4.F.10: Summary of Existing and Existing Plus Project Traffic Noise Levels, p. 4.F.52-4.F.56, these modeled traffic noise levels were used to determine the change in traffic noise levels resulting from changes in traffic volumes. The above thresholds (more than a 5-dBA increase, or 3-dBA increase where ambient noise levels are Conditionally Acceptable, Conditionally Unacceptable, or Unacceptable for noise-sensitive receptors) were applied to determine whether the incremental noise increases is considered significant.

Noise Limits and Performance Standards Applied in Analysis

The Police Code and Green Building Code impose noise limits and are applied in this impact analysis as significance thresholds and as performance standards in mitigation measures. These performance standards will be applied to the future design of Proposed Project residential and commercial-office buildings:

- Section 2909 of the Police Code generally prohibits noise produced by fixed noise sources (any machine or device) to result in noise levels that exceed the existing ambient (L_{90}) noise level by more than 5 dBA on residential property, 8 dBA on commercial and industrial property, and 10 dBA on public property at a distance of 25 feet. These noise limits were applied in Impact NO-4 to stationary sources as a first step or initial screening review.
- Section 2909(c) of the San Francisco Police Code generally prohibits noise produced by any machine or device in excess of 10 dBA more than ambient on public property at a distance of 25 feet. This noise limit is applied to future open space uses in Impact NO-6, and is also included as a performance standard in Mitigation Measure M-NO-6, fourth bullet.

[20] California Department of Transportation, Division of Environmental Analysis, "Technical Noise Supplement," November 2009; pp. 2-48 – 2-49. Available online at: http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf.

[21] Fehr & Peers, Pier 70 Mixed-Use District Project Transportation Impact Study, December 2016.

- Section 2909(d) of the Police Code establishes that no fixed noise sources (e.g., mechanical equipment) may cause the noise level inside any sleeping or living room in any dwelling unit located on residential property to exceed 55 dBA (7:00 a.m. to 10:00 p.m.) and 45 dBA (10:00 p.m. to 7:00 a.m.) in order to prevent sleep disturbance, protect public health, and prevent the acoustical environment from progressive deterioration. This noise limit is applied in Impact NO-4 to stationary sources that would be located near residential uses (as a second step or more detailed review, where initial screening review of noise limits in the above Section 2909 were exceeded) and in Impact NO-6 to residential interior noise levels. The nighttime interior noise standard is also included as a performance standard in Mitigation Measures M-NO-4a and M-NO-6, second bullet.
- Title 24 of the California Building Code specifies a maximum interior noise limit of 45 dBA (L_{dn} or CNEL) for residential uses. This standard is applied in Impact NO-6 to residential development (see Tables 4.F.11: Noise Compatibility by Parcel - Maximum Residential Scenario, pp. 4.F.61-4.F.64, and 4.F.12: Noise Compatibility by Parcel - Maximum Commercial Scenario, pp. 4.F.65-4.F.68). It was also included as a performance standard in Mitigation Measure M-NO-6.
- City noise compatibility guidelines (Figure 4.F.3, p. 4.F.23) indicate the maximum noise levels considered "Acceptable" are 60 dBA (L_{dn}) for residential uses. However, where noise levels exceed 70 dBA (L_{dn}), new residential development is generally discouraged. If new construction does proceed, a detailed analysis of noise reduction requirements must be made, and needed noise insulation features must be incorporated into the design. These guidelines are applied in Impact NO-6 to all proposed sensitive uses (see Tables 4.F.11 and 4.F.12, pp. 4.F.61-4.F.64 and pp. 4.F.65-4.F.68, respectively). Tables 4.F.11 and 4.F.12 identify noise compatibility of proposed uses by parcel or building and applicable mitigation measures for each parcel (if any).

Vibration

Vibration impacts are considered significant if they would result either in levels substantial enough to result in damage to nearby structures or buildings, or in vibration levels generally accepted as an annoyance to land uses containing sensitive receptors. Groundborne noise occurs when vibrations transmitted through the ground result in secondary radiation of noise. Construction-related groundborne noise is generally associated with underground construction activities where the airborne noise path is blocked, which is not proposed as part of this project. Therefore, this analysis is focused on groundborne vibration from construction-related activities such as the use of certain types of pile-driving and heavy equipment (Impact NO-3; Table 4.F.8, p. 4.F.34).

There are no City regulations that address vibration effects or provide numerical thresholds for determining when groundborne vibration impacts are considered significant. In the absence of City significance thresholds for vibration from construction equipment, this evaluation uses the Caltrans-identified PPV thresholds for architectural damage to buildings. For adverse human reaction, this

analysis applies the "strongly perceptible" threshold of 0.1 in/sec PPV.[22] For building damage, the threshold depends on the architectural characteristics of the potentially affected structure (see Table 4.F.5, p. 4.F.18).

PROJECT FEATURES

The Proposed Project would include amendments to the *General Plan* and Planning Code, adding a new Pier 70 SUD, which would establish land use controls for the project site and incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development* document.

Under the proposed Pier 70 SUD, the Proposed Project would provide a mixed-use land use program. To cover a full range of potential land uses that could be developed under the Proposed Project, the EIR analyzes a maximum residential use scenario (Maximum Residential Scenario) and a maximum commercial use scenario (Maximum Commercial Scenario) for the project site, which will bracket specific maximum ranges of uses that could be developed.

Proposed land uses on each parcel in the project site under both scenarios are presented in Figure 2.7: Proposed Land Use Plan – Maximum Residential Scenario, and Figure 2.8: Proposed Land Use Plan – Maximum Commercial Scenario, in Chapter 2, Project Description, pp. 2.30 and 2.32, respectively. Table 4.F.7: Project Summary Table by Parcel, summarizes proposed uses and height limits, and also indicates whether new construction or building rehabilitation is proposed by parcel. Under both scenarios, two parcels (C1 and C2) on the project site that are designated for district-structured parking could be developed with residential/commercial uses or residential use, depending on future market demand. Specifically, Parcel C1 could be developed with residential, commercial, or parking uses, and Parcel C2 could be developed with residential or parking uses. Active or passive public rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on the roof of both of these parcels under both scenarios as well if the parcels are built as district parking structures. Accessory, surface, and below-grade parking would be allowed on all parcels on the 28-Acre Site except Buildings 2, 12, and 21 and Parcel E4. These buildings would be renovated and converted into commercial, retail/arts/light industrial (RALI), or residential uses. RALI uses would be allowed on the ground-floor levels of all future buildings on Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, H2, PKN, PKS, HDY1, and HDY2. Building 2 would allow either commercial or residential uses, with RALI allowed on the ground floor. Buildings 12 and 21 as well as Parcel E4 would allow RALI only with commercial allowed on the upper floor. On the Illinois Parcels, retail/restaurant uses would be allowed on the ground floor, while accessory parking would be allowed on all four parcels. No residential uses would be allowed on the ground floor of PKN.

[22] Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013.

Table 4.F.7: Project Summary Table by Parcel

Project Parcel/ Building	Max Res Scenario Proposed Use	Construction Phase[1]	Max Com Scenario Proposed Use	Construction Phase[1]	Building Rehabilitation	New Construction
28-Acre Site[2]						
Parcel A	Commercial	3	Commercial	2		X
Parcel B	Commercial	4	Commercial	4		X
Parcel C1[c3]C1[c]	Residential/Parking (rooftop open space)	2	Commercial/Parking (rooftop open space)	4		X
Parcel C1[3]	Residential/Parking (rooftop open space)	2	Residential/Parking (rooftop open space)	3		X
Parcel D	Residential	2	Residential	2		X
Parcel E1	Residential	4	Residential	3		X
Parcel E2	Residential	2	Residential	2		X
Parcel E3	Residential	4	Residential	4		X
Parcel E4	RALI	4	RALI	4		X
Parcel F	Residential	3	Commercial	3		X
Parcel G	Residential	3	Commercial	3		X
Parcel H1	Residential	5	Commercial	5		X
Parcel H2	Residential	5	Commercial	5		X
Building 2	Residential	2	Commercial	2	X	
Building 12	RALI	2	RALI	2	X	
Building 21	RALI	4	RALI	4	X	
Illinois Parcels[4]						
20th/Illinois Parcel PKN	Residential	1	Residential	1		X
20th/Illinois Parcel PKS	Residential	3	Residential	2		
Hoedown Yard HDY	Residential	4	Commercial	3		X

Notes:

1 Timing of phases is expected to be as follows: Phases 1 and 2 (2018-2020), Phase 3 (2021-2023), Phase 4 (2024-2026), and Phase 5 (2027-2029).

2 All 28-Acre Site parcels except existing Buildings 2, 12, and 21 would be permitted to include parking as an accessory use (both above or below grade). Buildings 2, 12, and 21 would be renovated and converted into commercial, RALI, or residential uses. Also RALI uses would be on the ground-floor levels of all future buildings on Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, H2, PKN, PKS, HDY1, HDY2, and Buildings 2 and 12. Parcel E4 and Building 21 would contain only RALI uses.

3 Under both scenarios, Parcel C1 could be developed with residential, commercial, or parking uses and Parcel C2 could be developed with residential or parking uses. Active public rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on the roof of both of these parcels under both scenarios as well, if the parcels are built as district parking structures.

4 Retail/Restaurant uses would be allowed on the ground floor and accessory parking would be allowed on all four parcels.

Source: Forest City; Turnstone / SWCA

Open spaces programmed as part of the Proposed Project are anticipated to accommodate public outdoor events, including art exhibitions, theater performances, cultural events, outdoor fairs, festivals and markets, outdoor film screenings, evening/night markets, food events, street fairs, and lecture services. Fewer than 100 events per year are anticipated, including approximately 25 mid-size events attracting attendance between 500-750 people, and four larger-size events attracting up to 5,000 people.

Proposed Construction Phasing

For both development scenarios, the Maximum Residential Scenario and the Maximum Commercial Scenario, Proposed Project construction is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve up to five phases, designated as Phases 1, 2, 3, 4, and 5 (see Figure 2.26: Proposed Phasing Plan – Maximum Residential Scenario, and Figure 2.27: Proposed Phasing Plan – Maximum Commercial Scenario, in Chapter 2, Project Description, pp. 2.82 and 2.85, respectively). Phasing may not occur exactly as laid out in the conceptual phasing plan, but this plan provides a representative approximation of project phasing.

The project applicant, Forest City, as master developer, would be responsible for completing infrastructure improvements (e.g., utilities, streets, open space) and site preparation/grading. Within each phase, such infrastructure development would occur in tandem with the development of adjacent parcels. Third-party developers would construct vertical development on individual parcels. Figures 2.26 and 2.27 show proposed phasing of open space and roadways. Proposed phasing plans are estimates and subject to change. Project build-out and design could vary from the phasing plans depending on market demand.

IMPACT EVALUATION

Project Construction

Impact NO-1: Construction of the Proposed Project would expose people to or generate noise levels in excess of standards in the Noise Ordinance (Article 29 of the San Francisco Police Code) or applicable standards of other agencies. ***(Less than Significant with Mitigation)***

<u>On-Site Equipment Operation</u>

Construction activity noise levels at and near any construction site would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment. Construction-related material haul trips would increase ambient noise levels along haul routes, with the magnitude of the increase depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises

(such as pile driving), which can be particularly annoying to most people. Given the project's proximity to the Bay, it is assumed that at least some development in the project site area, such as construction of the secant walls proposed in the northeastern and southeastern portions (near Parcels B and H2) would entail pile-driving activities.

Table 4.F.8: Typical Construction Noise Levels, shows typical noise levels associated with a range of construction equipment. As indicated in this table, operation of jackhammers and concrete saws would have the potential to exceed the 86 dBA at 50 feet or 80 dBA at 100 feet noise limit for construction equipment (as specified by the Police Code) by 2 to 4 dBA. While jackhammers with approved acoustic shields are exempt from this ordinance limit,[23] concrete saws would not be exempt. Therefore, operation of concrete saws or any other equipment not exempt from the Police Code that exceeds 86 dBA (L_{eq}) at 50 feet would be a significant noise impact.

However, implementation of noise control measures as specified in Mitigation Measure M-NO-1: Construction Noise Control Plan, shown below, would ensure that all construction equipment noise subject to the noise ordinance be maintained at or below the 86-dBA limit, reducing potential construction-related noise impacts on off-site residents and future on-site residents affected by later construction phases to a less-than-significant level.

Mitigation Measure M-NO-1: Construction Noise Control Plan.

Over the project's approximately 11-year construction duration, project contractors for all construction projects on the Illinois Parcels and 28-Acre Site will be subject to construction-related time-of-day and noise limits specified in Section 2907(a) of the Police Code, as outlined above. Therefore, prior to construction, a Construction Noise Control Plan shall be prepared by the project sponsors and submitted to the Department of Building Inspection. The construction noise control plan shall demonstrate compliance with the Noise Ordinance limits. Noise reduction strategies that could be incorporated into this plan to ensure compliance with ordinance limits may include, but are not limited to, the following:

- Require the general contractor to ensure that equipment and trucks used for project construction utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically-attenuating shields or shrouds).
- Require the general contractor to locate stationary noise sources (such as compressors) as far from adjacent or nearby sensitive receptors as possible, to muffle such noise sources, and to construct barriers around such sources and/or the construction site, which could reduce construction noise by as much as 5 dBA. To further reduce noise, the contractor shall locate stationary equipment in pit areas or excavated areas, to the maximum extent practicable.

[23] See Section 2907(b) of the Police Code.

Table 4.F.8: Typical Construction Noise Levels

Construction Equipment	Noise Level (dBA, Leq at 50 feet)	Noise Level (dBA, Leq at 100 feet)
Jackhammer (Pavement Breaker)[1]	**88**	**82**
Concrete Saw or Mounted Impact Hammer (Hoe Ram)	**90**	**84**
Loader	79	73
Dozer	82	76
Excavator	81	75
Grader	85	79
Compactor	83	77
Dump Truck	76	70
Flatbed Truck	74	68
Concrete Truck	81	75
Forklift (gas-powered)	83	77
Street Sweeper (vacuum)	82	76
Generator	81	75
Compressor	78	72
Roller	80	74
Crane	81	75
Paver	77	71
Pile Driver[1]	**101**	**95**
San Francisco Noise Ordinance Limit	86	80

Notes: The above Leq noise levels are calculated assuming a 100 percent usage factor at full load (i.e., Lmax noise level 100 percent) for the 1-hour measurement period. Noise levels in **bold** exceed the above ordinance limit, but as indicated, two of the three exceedances are exempt from this limit.

[1] Exempt from the ordinance noise limit of 86 dBA at 50 feet or 80 dBA at 100 feet.

Sources: U.S. Department of Transportation, Federal Highway Administration, 9.0 Construction Equipment Noise Levels and Ranges, Table 9.1, RCNM Default Noise Emission Reference Levels and Usage Factors, Construction Noise Handbook, Updated July 2011. Available online at http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm Accessed January 4, 2016; U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006. Available online at http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf. Accessed January 4, 2016.

- Require the general contractor to use impact tools (e.g., jack hammers, pavement breakers, and rock drills) that are hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used, along with external noise jackets on the tools, which would reduce noise levels by as much as 10 dBA.
- Include noise control requirements for construction equipment and tools, including concrete saws, in specifications provided to construction contractors to the maximum extent practicable. Such requirements could include, but are not limited to, erecting temporary plywood noise barriers around a construction site, particularly where a site adjoins noise-sensitive uses; utilizing noise control blankets on a building structure as the building is erected to reduce noise levels emanating from the construction site; performing all work in a manner that minimizes noise; using equipment with effective mufflers; undertaking the most noisy activities during times of least disturbance to surrounding residents and occupants; and selecting haul routes that avoid residential uses.[24]
- Prior to the issuance of each building permit, along with the submission of construction documents, submit to the Planning Department and Department of Building Inspection or the Port, as appropriate, a plan to track and respond to complaints pertaining to construction noise. The plan shall include the following measures: (1) a procedure and phone numbers for notifying the Department of Building Inspection or the Port, the Department of Public Health, and the Police Department (during regular construction hours and off-hours); (2) a sign posted on-site describing permitted construction days and hours, noise complaint procedures, and a complaint hotline number that shall be answered at all times during construction; (3) designation of an on-site construction complaint and enforcement manager for the project; and (4) notification of neighboring residents and non-residential building managers within 300 feet of the project construction area at least 30 days in advance of extreme noise-generating activities (such as pile driving) about the estimated duration of the activity.

Implementation of Mitigation Measure M-NO-1 would reduce construction equipment noise impacts relating to the Noise Ordinance to a less-than-significant level.

[24] Based on FHWA documentation, the following reductions can be achieved: 3-dBA reduction for a noise barrier or other obstruction (like a dirt mound) that interrupts the line-of-sight between the noise source and the receptor; 8-dBA reduction if the noise source is completely enclosed or completely shielded with a solid barrier located close to the source; 5-dBA reduction if the enclosure and/or barrier have some gaps in it; 10-dBA reduction if the noise source is completely enclosed and completely shielded with a solid barrier located close to the source; 15-dBA reduction if a building stands between the noise source and receptor and completely shields the noise source; and 5-dBA reduction if noise source is enclosed or shielded with heavy vinyl noise curtain material (e.g., SoundSeal BBC-13-2 or equivalent).

Impact NO-2: Construction of the Proposed Project would cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. ***(Significant and Unavoidable with Mitigation)***

On-Site Construction Activities

Project implementation would result in operation of heavy equipment on the project site for demolition of existing structures, construction of new structures, and rehabilitation of on-site structures to be retained. Construction activities would occur intermittently on the project site over the 11-year construction duration and could expose nearby sensitive receptors to temporary increases in noise levels substantially in excess of ambient levels.

Proposed redevelopment of the Pier 70 Mixed-Use District project site would result in demolition of seven existing structures, removal of a portion of Irish Hill, demolition of portions of the existing Slipways 5 through 8, construction of new buildings, and rehabilitation of three existing buildings (Figure 2.6: Proposed Rehabilitation, Retention, and Demolition Plan, in Chapter 2, Project Description, p. 2.24, shows the proposed buildings and other structures to be demolished as well as existing buildings to be rehabilitated). Construction activities associated with new building construction would include site preparation, pile driving, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition and construction activities would require the use of heavy trucks, material loaders, cranes, concrete saws, and other mobile and stationary construction equipment listed in Table 4.F.8, p. 4.F.34. Piles would be driven with the use of impact or vibratory pile drivers. General building construction would be less noise intrusive, involving cranes, forklifts, saws, and nail guns. Project construction would also result in temporary increases in truck traffic noise along haul routes for off-hauling excavated materials and materials deliveries.

Because the project would be constructed in phases over an 11-year period, multiple construction activities could be occurring on different parcels within the project site at any given time (i.e., demolition could occur on one parcel while pile driving occurs on another) so that some of the noisier construction activities, such as pile driving, on one project parcel could overlap with other noisier construction phases, such as demolition, on other parcels. If pile drivers operated on one parcel while a mounted impact hammer or concrete saw (for demolition) occurred on another parcel at the same time (worst-case condition), the combined noise level from these two noisiest pieces of equipment would be 89 dBA (L_{eq}) at 50 feet.[25] When compared to the FTA daytime

[25] A 20 percent usage factor was applied to both pieces of equipment. Pile drivers generate 101 dBA (L_{max}) or 88 dBA (L_{eq}) with a 20 percent usage factor. Mounted impact hammers generate 90 dBA (L_{max}) or 83 dBA (L_{eq}) with a 20 percent usage factor. If these two pieces of equipment were to operate at the same time in the same vicinity (not likely since one would be used for demolition and the other as part of foundation work), the combined noise level would be 89 dBA (L_{eq}).

thresholds of 90 dBA (L_{eq}) at residential uses, the maximum combined L_{eq} noise level would not exceed these thresholds because it is expected that both types of equipment would not operate simultaneously closer than 50 feet to any existing residential or commercial uses. It is noted that while pile driving and demolition activities could occur at any given time over the 11-year construction duration, they would not occur continuously over this time period and it is unlikely that pile drivers and either impact hammers or concrete saws would operate simultaneously at closer than 50 feet from any existing residential or commercial uses for any sustained period of time.

Noise Impacts on Off-Site Receptors

As listed in Table 4.F.5, p. 4.F.11, the closest existing off-site sensitive receptors are located 140 to 200 feet from the closest site boundary (northwest corner of Parcel PKN). When construction occurs near the northwest corner of Parcel PKN, the maximum combined L_{eq} noise level of 89 dBA (L_{eq}) at 50 feet would attenuate to 80 dBA and 77 dBA (L_{eq}) at these respective receptors. Measurement Location LT-4 (across the street from the 820 Illinois Street residential development) is the closest noise measurement location to these receptors. Ambient noise levels averaged 62 dBA (L_{dn}) or an average of 57 dBA (daytime L_{eq}) at this location and when these ambient noise levels are applied to the "Ambient+10 dBA" threshold, the thresholds would be 72 dBA (L_{dn}) or 67 dBA (daytime L_{eq}) at these receptors and the maximum combined noise levels at the three closest off-site receptors would exceed these thresholds by up to 13 dBA, a significant noise impact.

For all but these three receptor locations (residences at 820 Illinois Street and 628 20th Street (second floor), and Dogpatch Alt School at 616 20th Street), there are intervening buildings that would block and reduce Proposed Project-related construction noise at nearby existing receptors.[26] For example, the AIC building to the west of the site would interrupt the line-of-sight (at ground level and lower floors) between the project site and existing residential receptors located west of the AIC building. If phasing occurs as proposed, it would result in the construction of residential buildings on the western portion of the project site (Illinois Parcels) first. These buildings would also help block and reduce project-related construction noise (including noise from pile-driving activities to the east on the 28-Acre Site) at all existing off-site receptors (including the closest existing receptors).

With implementation of noise controls during all construction phases (specified in Mitigation Measure M-NO-1) as well as implementation of noise controls during pile driving (specified in Mitigation Measure M-NO-2: Noise Control Measures During Pile Driving, pp. 4.F.40-4.F.41), the potential for noise disturbance of existing off-site receptors (assumed to be present during the

[26] The three exceptions are the east-facing existing residential units on the upper floors of the residential building at 820 Illinois Street (located approximately 200 feet northwest of the project site boundary), second floor residence at 628 20th Street (located about 190 feet to the northwest) and the Dogpatch Alt School (Site 2) at 616 20th Street (located about 140 feet from the project site boundary).

11-year construction period) located approximately 140 to 200 feet to the northwest would be reduced. However, even with implementation of these noise controls, the feasibility of quieter, alternative pile driving methods in all areas cannot be determined at this time and also the potential would still exist that combined noise levels from simultaneous operation of the noisiest types of construction equipment could still exceed the Ambient+10 dBA threshold. Given this uncertainty and the potential 11-year duration of this activity, this impact is conservatively considered to remain significant and unavoidable with mitigation, even with implementation of Mitigation Measures M-NO-1 and M-NO-2.

Noise Impacts on On-Site Receptors

While early construction of Proposed Project residential uses on the Illinois Parcels would help reduce construction-related noise levels at existing receptors, it would also expose future residents living in these new residential buildings to construction noise generated during subsequent phases of project construction. Construction activities in this area would occur in phases over an 11-year period. Phasing may not occur exactly as laid out in the conceptual phasing plan, but this plan provides a representative approximation of project phasing.

If Proposed Project phasing occurs as proposed for the Maximum Residential Scenario, residential uses would be developed during all five phases (2018 to 2029), while commercial and RALI uses would be developed during all phases except Phase 1. If Proposed Project phasing occurs as proposed for the Maximum Commercial Scenario, more residential areas would be developed in the early phases (Phases 1, 2, and 3; 2018 to 2023) while more commercial uses would be developed in the later phases (Phases 3, 4, and 5; 2021 to 2029).

As a result of this possible phasing under either scenario, future residents in the project site area that face an adjacent or nearby construction project could be subject to demolition and construction noise for as long as 6 to 9 years. Construction-related noise generated on any given parcel would primarily affect receptors located within about 900 feet and with a direct line-of-sight (a piece of equipment generating 85 dBA would attenuate to 60 dBA over a distance of 900 feet). Depending on the order of construction within each phase and overall phasing, some Proposed Project buildings that have already been constructed could interrupt the direct line-of-sight between construction sources and noise-sensitive receptors, and reduce the number of receptors directly exposed to construction noise with no intervening buffering structure.

It is likely that pile driving would be required for construction of some buildings or structures on the 28-Acre Site and possibly on the northern portion of the Illinois Parcels. Construction of secant walls in the northeastern and southeastern portions of the 28-Acre Site could also require pile driving on upland portions of the site. In addition, other impact tools such as jackhammers, concrete saws, or mounted impact hammers (hoe rams) could be used during demolition

activities. As indicated above, simultaneous operation of such equipment would generate a maximum combined L_{eq} noise level of 89 dBA (L_{eq}) at 50 feet. Future on-site residents with a direct line-of-sight and 50 feet from demolition or construction activities could be subject to such maximum combined noise levels. As listed in Table 4.F.3, p. 4.F.11, ambient noise levels on the project site ranged between 58 dBA and 68 dBA (L_{dn}) and averaged 64 dBA (L_{dn}). Daytime noise levels ranged from 53 dBA (L_{eq}) to 73 dBA (L_{eq}) and average 61 dBA (L_{eq}). When these ambient noise levels are applied to the "Ambient+10 dBA" threshold, the average thresholds are 74 dBA (L_{dn}) and 71 dBA (daytime L_{eq}) at on-site receptors, and the maximum combined noise level of 89 dBA (L_{eq}) at 50 feet would, at times, exceed these thresholds at the closest future on-site residential receptors (those occupying residential units built in earlier phases) by up to 18 dBA. The degree of disturbance would vary with proximity of the demolition and construction activities to sensitive receptors, but is considered significant and unavoidable because the "Ambient +10 dBA" threshold could be exceeded.

Construction of proposed changes to the street network, new infrastructure (including those associated with all three sewer options), and open space improvements in the project site area would include use of similar construction equipment as would development projects, although typically for a lesser duration and generally with fewer pieces of equipment than for a major development. Accordingly, construction noise impacts associated with the street network, new infrastructure, and open space would be similar to, but somewhat less substantial than, those for development projects in the project site area, except that pile driving would not be necessary for the street network changes, utility lines (including those associated with all three sewer options), or open space improvements. Building demolition, road construction, and building construction would all occur concurrently within each phase. It is expected that infrastructure improvements (including utility lines proposed in roadways) would be done at the same time as road construction. Construction of open spaces would occur during all five phases of construction. Simultaneous operation of the noisiest pieces of equipment associated with demolition (mounted impact hammer or concrete saw) and other construction activities (excavator) would result in a combined noise level of 85 dBA (L_{eq}) at 50 feet. Such maximum combined noise levels would still exceed the average "Ambient+10 dBA" thresholds of 74 dBA (L_{dn}) or 71 dBA (daytime L_{eq}) at on-site receptors located at this proximity. Therefore, construction-related noise increases during other phases of construction, such as construction for road and infrastructure improvements, could adversely affect future on-site residents, a significant noise impact.

With implementation of noise controls during all construction phases (specified in Mitigation Measure M-NO-1) as well as implementation of noise controls during pile driving (specified in Mitigation Measure M-NO-2), the potential for noise disturbance of future on-site residents would be reduced. However, even with implementation of these noise controls, the potential would still exist that combined noise levels from simultaneous operation of the noisiest types of

construction equipment could still exceed the Ambient+10 dBA threshold, and therefore, construction-related noise impacts on future on-site residential receptors is conservatively considered to be significant and unavoidable with mitigation.

Off-Site Haul Truck Traffic

The net export total of about 340,000 cubic yards of soil and an import of about 20,000 cubic yards of clean fill would generate a total of about 45,000 truck trips, which would be phased over the duration of the planned construction activities (averaging 17 truck trips per day). This average daily increase would be minor on the principal major access streets in the project vicinity, comprising less than 0.1 percent of daily traffic on Illinois Street in the project vicinity and an even smaller percentage of daily traffic on Third Street. Construction-related truck trips generated during the estimated 11-year Proposed Project construction duration would be required by the Construction Traffic Control Plan to travel on designated truck routes (i.e., Third Street and Cesar Chavez Street for regional access to the I-280 and SR 101 freeways[27]), minimizing truck traffic in residential areas. There are residential uses on Third Street between 22nd Street and 23rd Street, but no residential uses on Third Street to the south (between 23rd Street and Cesar Chavez Street). There are no existing residential uses on Cesar Chavez Street between Third Street and the SR 101 freeway. There are also no residential uses on Illinois Street between 22nd Street and Cesar Chavez Street, although Illinois Street is not a designated truck route. Given the minimal increase in traffic on local roadways that would be attributable to project-related haul trucks, temporary increases in traffic noise resulting from haul trucks would be less than significant. Use of truck routes that avoid residential uses as required by the Construction Traffic Control Plan would further reduce less-than-significant construction-related truck noise impacts.

Mitigation Measure M-NO-2: Noise Control Measures During Pile Driving

The Construction Noise Control Plan (required under Mitigation Measure M-NO-1) shall also outline a set of site-specific noise and vibration attenuation measures for each construction phase when pile driving is proposed to occur. These attenuation measures shall be included wherever impact equipment is proposed to be used on the Illinois Parcels and/or 28-Acre Site. As many of the following control strategies shall be included in the Noise Control Plan, as feasible:

- Implement "quiet" pile-driving technology such as pre-drilling piles where feasible to reduce construction-related noise and vibration.
- Use pile-driving equipment with state-of-the-art noise shielding and muffling devices.

[27] San Francisco Municipal Transportation Agency, 2009, *San Francisco Truck Traffic Routes.* Trucks are expected to use truck routes, arterials, or freeways except for local deliveries.

- Use pre-drilled or sonic or vibratory drivers, rather than impact drivers, wherever feasible (including slipways) and where vibration-induced liquefaction would not occur.
- Schedule pile-driving activity for times of the day that minimize disturbance to residents as well as commercial uses located on-site and nearby.
- Erect temporary plywood or similar solid noise barriers along the boundaries of each Proposed Project parcel as necessary to shield affected sensitive receptors.
- Other equivalent technologies that emerge over time.

While implementation of construction-related noise control measures in Mitigation Measure M-NO-1 and pile-driving noise reduction measures in Mitigation Measure M-NO-2 would reduce the project's temporary or periodic increases in ambient noise levels, these measures would not necessarily reduce these noise increases to below the Ambient+10 dBA threshold because feasibility of quieter, alternative pile driving methods in all areas cannot be determined at this time. Given this uncertainty and the potential 11-year duration of this activity, this impact is conservatively considered to remain significant and unavoidable, even with implementation of Mitigation Measures M-NO-1 and M-NO-2.

Impact NO-3: Construction of the Proposed Project would expose people and structures to or generate excessive groundborne vibration levels. ***(Less than Significant with Mitigation)***

Groundborne Noise and Vibration

Groundborne noise refers to a condition where noise is experienced inside a building or structure as a result of vibrations produced outside of the building and transmitted as ground vibration between the source and receiver. Groundborne noise can be problematic even in situations where the primary airborne noise path is blocked, such as in the case of construction of a subway tunnel in proximity to homes or other noise-sensitive structures. While the Proposed Project would involve excavation to a maximum depth of 27 feet, noise and vibration-generating construction activities associated with construction of proposed basement levels would not involve tunneling or underground construction where the airborne noise path is blocked. Therefore, impacts related to groundborne noise from construction activities are not expected to be substantial.

The Proposed Project would include the types of construction activities that could produce excessive groundborne vibration (i.e., pile driving for foundations or secant walls). In addition, construction equipment used for demolition, site preparation, and shoring activities, such as jackhammers, pavement breakers, and drills, could generate varying degrees of temporary groundborne vibration, with the highest levels expected during demolition, excavation, and below-grade construction stages of each construction phase. Excavation for basements on the Illinois Parcels would require excavation into bedrock where use of hoe-rams or jackhammers would be

required. Project construction would also entail the use of heavy trucks for material deliveries and for off-site hauling of excavated materials and demolition debris during the daytime hours and throughout the 11-year construction period. All construction activities would be conducted primarily between 7:00 a.m. and 8:00 p.m. in compliance with Section 2908 of the City's Noise Ordinance and subject to noise controls outlined in Mitigation Measures M-NO-1 and M-NO-2.

If groundborne vibration generated by project-related demolition and construction activities were to exceed 0.5 in/sec PPV, it could cause cosmetic damage to a nearby structure. Older structures (i.e., potentially historic), such as the unreinforced monumental masonry Buildings 113 and 114 (building locations are indicated on Figure 4.D.2: Contributing and Non-contributing Features on the Project Site, in Section 4.D, Cultural Resources, p. 4.D.37), may be more fragile and cosmetic damage could occur at lower vibration levels (possibly as low as 0.2 in/sec PPV). Typical vibration levels associated with the operation of various types of construction equipment at 25, 60, and 160 feet, some of which are similar to those proposed to be used for the Proposed Project, are listed in Table 4.F.9: Vibration Levels for Construction Equipment. While vibration attenuation with distance can vary depending on subsoils, normal attenuation rates indicate that vibration generated by impact pile drivers could result in cosmetic damage to adjacent historic buildings if it occurs within 160 feet of these buildings. Parcel PKN is located approximately 80 feet from the older Buildings 113 and 114, and Parcel A is located approximately 50 feet from Building 113. Cosmetic damage to project buildings could occur if impact pile drivers are operated within 70 feet of project structures and 160 feet of Buildings 113 or 114, assuming maximum reference vibration levels. Use of sonic or vibratory pile drivers, if feasible, would generate lower levels of vibration with commensurate minimum setback distances of approximately 35 feet from project structures and 70 feet from historic buildings required to avoid cosmetic damage.

Pile driving and building locations on project parcels have not been specified for the entire site, but pile driving is proposed adjacent to and east of the 20th Street Historic Core, which adjoins the northwestern boundary of the 28-Acre Site and eastern boundary of the 20th/Illinois Parcels. While it may be possible to maintain a setback of 70 feet or more between pile drivers and adjacent structures at many locations to avoid cosmetic damage to adjacent structures, the minimum separation between some parcels such as between Parcel E1, Parcel E4, and Building 21 or between Parcels E2 and E3 would be less than 70 feet. At distances of less than 70 feet, vibration from impact or vibratory pile-driving activities could result in cosmetic damage to Proposed Project structures and historic Buildings 113 and 114, a significant vibration impact. When the more stringent threshold of 0.2 in/sec PPV is applied to historic buildings, cosmetic damage could occur at distances of up to 160 feet from historic buildings (as indicated in Table 4.F.9). However, implementation of measures such as evaluating specific potentially historic buildings,

Table 4.F.9: Vibration Levels for Construction Equipment

Equipment	Peak Particle Velocity (PPV) (in/sec)		
	At 25 Feet	At 60 Feet[1]	At 160 Feet[1]
Impact or Vibratory Pile Driver			
Range	0.170–1.518	0.065–0.579	0.022-0.197
Typical	0.65	0.248	0.084
Other Construction Equipment			
Vibratory Roller/Compactor	0.210	0.080	0.027
Large Bulldozer	0.089	0.034	0.012
Caisson Drilling	0.089	0.034	0.012
Loaded Trucks	0.076	0.029	0.010
Jackhammer	0.035	0.013	0.005
Small Bulldozer	0.003	0.001	0.000

Note:

[1] Vibration amplitudes for construction equipment assume normal propagation conditions and were calculated using the following formula: PPV equip = PPVref x $(25/D)^{1.1}$ where:

- PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
- PPV (ref) = the reference vibration level in in/sec from pages 31-33 and Table 18 of the Caltrans Vibration Guidance Manual as well as Table 12-2 of the FTA Noise and Vibration Guidance Manual
- D = the distance from the equipment to the receiver

Source: Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013, pp. 29-34. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed on December 16, 2016; Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006. Available online at https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/noise-and-vibration. Accessed on December 16, 2016.

establishing and enforcing appropriate vibration limits for the affected structures based on site-specific conditions, and monitoring vibration levels at structures of concern (as specified in Mitigation Measure M-NO-3: Vibration Control Measures During Construction) would be adequate to reduce the potential for cosmetic damage to adjacent project and historic structures to a less-than-significant level. Depending on the timing of development at Parcels E2, E3, and E4, as well as the timing of the proposed relocation of Historic Building 21 to within 25 feet of new development, construction-related vibration impacts on this building from adjacent pile driving activities could be avoided entirely if development precedes relocation. If, however, relocation of Building 21 precedes development at adjacent Parcels E2, E3, and E4, significant vibration impacts could occur. If this occurred, implementation of Mitigation Measure M-NO-3 would reduce the potential for cosmetic damage to a less-than-significant level.

While vibratory pile driving (or similar continuous vibration sources) can reduce the potential impacts to fragile structures that can occur with impact pile driving (where higher intermittent vibration levels can occur when the hammer strikes the pile), continuous vibration can also cause liquefaction (or differential settlement in sandy soils), due to the continuous nature of the

vibration. AASHTO[28] states: "Saturated, loose, uniformly or poorly graded sands and silts are sensitive to cyclic vibration such as might be produced by vibratory pile driving. These activities can produce noticeable settlement even at low vibration levels (0.1 to 0.7 in/sec), which are known to produce threshold cracking." Evaluation of this potential, enforcement of an appropriate vibration limit, and using smaller equipment or pre-drilling pile holes, as specified in Mitigation Measure M-NO-3, would reduce the potential for structural damage from vibration-induced liquefaction to a less-than-significant level.[29]

Mitigation Measure M-NO-3: Vibration Control Measures During Construction

As part of the Construction Noise Control Plan required under Mitigation Measure M-NO-1, appropriate vibration controls (including pre-drilling pile holes and using smaller vibratory equipment) shall be specified to ensure that the vibration limit of 0.5 in/sec PPV can be met at adjacent or nearby existing structures and Proposed Project buildings located on the Illinois Parcels and/or 28-Acre Site, except as noted below:

- Where pile driving and other construction activities involving the use of heavy equipment would occur in proximity to any contributing building to the Union Iron Works Historic District, the project sponsors shall undertake a monitoring program to minimize damage to adjacent historic buildings and to ensure that any such damage is documented and repaired. The monitoring program, which shall apply within 160 feet where pile driving would be used and within 25 feet of other heavy equipment operation, shall include the following components:
  - Prior to the start of any ground-disturbing activity, the project sponsors shall engage a historic architect or qualified historic preservation professional to undertake a pre-construction survey of historical resource(s) identified by the San Francisco Planning Department within 160 feet of planned construction to document and photograph the buildings' existing conditions.
  - Based on the construction and condition of the resource(s), a structural engineer or other qualified entity shall establish a maximum vibration level that shall not be exceeded at each building, based on existing conditions, character-defining features, soils conditions and anticipated construction practices in use at the time (a common standard is 0.2 inch per second, peak particle velocity).
  - To ensure that vibration levels do not exceed the established standard, a qualified acoustical/vibration consultant shall monitor vibration levels at each structure within 160 feet of planned construction and shall prohibit vibratory construction activities that generate vibration levels in excess of the standard. Should vibration levels be observed in excess of the standard, construction shall be halted and alternative construction techniques put in practice. (For example, pre-drilled piles could be substituted for driven piles, if soil conditions allow;

[28] American Association of State Highway Transportation Officials (AASHTO), *Evaluation of Transportation-Related Earthborne Vibrations,* R 8-96, 2004.

[29] As discussed in "Geotechnical Stabilization" in Chapter 2, Project Description, p. 2.69, the Proposed Project would likely include the installation of below-grade secant pile walls along the northeastern and southeastern portions of the project site on either side of the craneways to prevent lateral spread from occurring.

smaller, lighter equipment could possibly also be used in some cases.) The consultant shall conduct regular periodic inspections of each building within 160 feet of planned construction during ground-disturbing activity on the project site. Should damage to a building occur as a result of ground-disturbing activity on the site, the building(s) shall be remediated to its pre-construction condition at the conclusion of ground-disturbing activity on the site.

- In areas with a "very high" or "high" susceptibility for vibration-induced liquefaction or differential settlement risks, the project's geotechnical engineer shall specify an appropriate vibration limit based on proposed construction activities and proximity to liquefaction susceptibility zones and modify construction practices to ensure that construction-related vibration does not cause liquefaction hazards at these homes.

Implementation of Mitigation Measure M-NO-3 would reduce vibration noise impacts to a less-than-significant level.

Project Operations

Impact NO-4: Operation of the Proposed Project would result in a substantial permanent increase in ambient noise levels in the immediate project vicinity, or permanently expose persons to noise levels in excess of standards in the San Francisco General Plan and San Francisco Noise Ordinance. ***(Less than Significant with Mitigation)***

Operation of the Proposed Project would increase ambient noise levels in the immediate vicinity of the project site, primarily through the on-site use of stationary equipment, such as emergency generators, heating/ventilation/air conditioning systems, a below-grade wastewater pump station, and outdoor activities in open space areas.

Stationary Equipment

Project implementation would add new mechanical equipment, such as heating/ ventilation/ air conditioning (HVAC) systems, which could produce operational noise. Operation of HVAC equipment would be subject to the City's Noise Ordinance. Under Section 2909 of the Police Code, stationary sources are not permitted to result in noise levels that exceed the existing ambient (L_{90}) noise level by more than 5 dBA on residential property, 8 dBA on commercial and industrial property, and 10 dBA on public property. Section 2909(d) states that no fixed noise source may cause the noise level measured inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dBA between 10:00 p.m. and 7:00 a.m. or 55 dBA between 7:00 a.m. and 10:00 p.m. with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

Based on noise measurements collected on the project site and its vicinity, the existing ambient (L_{90}) noise levels range between 44 and 58 dBA near the western boundary of the Illinois Parcels (LT-4 and LT-6) and between 57 and 62 dBA (LT-2) on the 28-Acre Site. Section 2909 of the

Police Code would allow mechanical equipment to generate up to 8 dB higher than the lowest ambient (or up to 52 dBA, L_{90}) near the western boundary of the Illinois Parcels and up to 8 dB higher (or up to 65 dBA, L_{90}) near the 28-Acre Site northern boundary. Depending on size, noise from HVAC equipment can generate noise levels of up to 75 dBA (L_{90}) at 30 feet. Assuming HVAC equipment operates 24 hours per day (worst-case), such noise levels would exceed ordinance noise limits if this equipment is placed near parcel boundaries, resulting in a significant impact. However, with incorporation of noise attenuation measures (e.g., provision of sound enclosures/barriers, addition of roof parapets to block noise, and increasing setback distances from sensitive receptors), as specified in Mitigation Measure M-NO-4a: Stationary Equipment Noise Controls, p. 4.F.50, HVAC-related noise would be reduced to ordinance noise limits (52 dBA) at the western boundary of the Illinois Parcels, and the mitigated noise level would attenuate to below 30 dBA at the closest existing sensitive receptors (140 to 200 feet away). With windows open, interior noise levels would be even lower and well below the 45-dBA nighttime interior noise limit (with windows open) specified in Section 2909, indicating that potential noise impacts would be reduced to less than significant. Other nearby sensitive receptors to the west, northwest, and southwest are located farther away and noise levels from project mechanical equipment would be less. Intervening buildings would also interrupt any direct lines-of-sight between these more distant receptors and rooftop noise sources.

With respect to on-site project residences, an interior noise level of 45 dBA (L_{dn} or CNEL) would be required by Title 24 of the California Building Code, and design of Proposed Project residences (under either the Maximum Residential or Maximum Commercial scenarios) would need to account for not only existing noise sources, as required by Title 24, but also future noise sources known at the time of development (including HVAC systems), as required in Mitigation Measure M-NO-4a. Therefore, incorporation of noise attenuation measures, as specified in Mitigation Measure M-NO-4a, would ensure compliance with the Section 2909 of the Police Code requirements in the interiors of Proposed Project residential units under both existing and future noise conditions, reducing potential noise impacts from stationary equipment to a less-than-significant level.

Emergency generators would be required on at least 11 of the proposed parcels where building heights would exceed 70 feet under both the Maximum Residential and Maximum Commercial scenarios, as well as at the proposed pump station. The only exception would be Parcel E1, which would not require an emergency generator under the Maximum Commercial Scenario, because the building on this parcel would be 65 feet high under this scenario. These parcels are located along the northern (A, B, D, and E1) and southern (F, G, H1, and H2) boundaries of the project site, as well as in the center of the site and just east of Irish Hill (C1 and C2). The closest existing off-site sensitive receptors would be located 700 feet or more from the closest of these buildings (C1). The emergency generators would create temporary noise from use during a power failure, could periodically result in temporary noise during testing to ensure their continued

reliability, and could operate continuously following a catastrophic emergency until electric power service is restored to the area. Emergency generators typically operate for approximately 1 hour per week (50 hours per year) and such a short noise event would not substantially alter ambient noise levels. Depending on the size, emergency generators can generate noise levels of 75 to 80 dBA (L_{eq}) at 50 feet and the L_{90} noise level would be similar to the L_{eq} level due to the continuous nature of generator noise. Although there are no existing off-site sensitive receptors within 700 feet of parcels that could contain buildings requiring generators, some of the Proposed Project buildings where emergency generators would be located would be developed with residential uses. Therefore, the Proposed Project's residential receptors could be located as close as 50 feet from these buildings/parcels. At this distance, noise levels generated by operation of emergency generators would exceed noise limits specified in Section 2909(d) of the Police Code (55 dBA from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10:00 p.m. to 7:00 a.m. inside any sleeping or living room in any dwelling unit located on residential property), a significant impact. However, with incorporation of noise attenuation measures specified in Mitigation Measure M-NO-4a, this impact would be reduced to a less-than-significant level.

A wastewater pump station (the 20th Street Pump Station) and electrical transformers are proposed to be located to the north of the 28-Acre Site between Building 108 and Building 6. Pumps associated with the pump station would be located below grade, while other pump station facilities and transformers would be above grade. Noise increases resulting from these new facilities would ultimately depend on the number and size of pumps, the size and type of transformers, extent of noise attenuation features incorporated into the facility design, ambient noise levels in the vicinity, and proximity to sensitive receptors. Although pump noise can be highly variable, below-grade pumps are estimated to generate approximately 52 dBA (L_{eq} or L_{90}) (due to the continuous nature of pump noise when operating) at 25 feet from any vent openings to the below-grade pump station structure.[30] In the same vicinity, transformers (up to 1,000 kilovolt amps [kVA]) could generate noise levels of up to 38-44 dBA (L_{eq} or L_{90} due to the continuous nature of transformer noise) at 25 feet, depending on the type of transformer (liquid immersed vs. dry-type).[31] As indicated in Table 4.F.3, p. 4.F.11, daytime L_{90} noise levels in this vicinity (LT-3) were measured to range from 52 to 58 dBA (L_{90}), and therefore, combined noise generated by these facilities (53 dBA, L_{eq} or L_{90}) would have a slight potential to increase ambient noise levels in this vicinity. Existing industrial uses (BAE Systems Ship Repair) and proposed commercial uses (under both the Maximum Residential and Maximum Commercial scenarios) would be located adjacent to this

[30] This level assumes that the interior level will not exceed 85 dBA (to avoid the need for OSHA worker hearing protection) and the building/enclosure reduces interior noise levels by 20 dBA at vent openings (conservative since most enclosures can provide at least 25 dB reductions).

[31] Transformer noise levels were estimated based on National Electrical Manufacturers Association standards (NEMA, *NEMA TR 1-2013, Transformers, Step Voltage Regulators and Reactors,* p. 4, 2014; NEMA *Transformers, Regulators and Reactors, No. TR 1,* p. 4, 1994. Since distance is not specified in NEMA standards, for the purpose of this analysis, levels were assumed to be a near-field noise level at 5 feet and then converted to a far-field noise level at 50 feet by applying a 20-dB reduction.

facility, and Section 2909(b) would limit noise increases adjacent to such uses to 8 dBA above ambient (L_{90}). Whether or not future noise levels exceed ordinance noise limits will ultimately depend on the size and design of the proposed wastewater pump station facilities as well as ambient noise levels at the closest property plane for the pump station. Given the range of existing ambient noise levels in the pump station vicinity, addition of the proposed pump station is conservatively considered to have the potential to slightly exceed ordinance noise limits, a significant impact. However, with implementation of Mitigation Measure M-NO-4a, the design of the wastewater pump station will be required to comply with applicable noise limits specified in Section 2909 of the Police Code and this would ensure this impact is reduced to less than significant. Compliance with this ordinance limit would ensure that project-related noise increases from this pump station would be maintained at acceptable levels at existing industrial uses, proposed commercial uses, and more distant proposed residential uses.

Other Noise-Generating Uses

Development of commercial-office uses in proximity to existing residential uses would increase the potential for noise disturbance or conflicts. Sources of noise typically associated with such non-residential uses that can cause sleep disturbance include mechanical equipment, delivery trucks and associated loading areas, parking cars, and use of refuse bins. Mechanical equipment (stationary noise sources) can include emergency generators as well as refrigeration and HVAC units, and associated noise impacts from these sources are discussed above.

With respect to delivery trucks, if deliveries and associated unloading/loading activities occur in proximity to future residential buildings and during the nighttime hours, future residents could be subject to sleep disturbance by noise from these activities. Noise typically associated with delivery trucks includes trucks maneuvering in and out of designated loading areas, audible warnings when trucks reverse into loading areas, idling during deliveries, opening and closing of truck doors and rollup doors, use of rolling hand carts and dollies, and engines starting. There would be a potential for sleep disturbance from these types of noise under both scenarios, because all future commercial-office or RALI buildings would be located adjacent to one or more residential buildings (as close as 23 to 38 feet in some instances), a potentially significant noise impact. The California Air Resources Board limits the idling of diesel trucks (over 10,000 pounds) to no more than 5 minutes, and this rule would help minimize truck idling noise in loading areas. Audible warnings are required by Cal-OSHA to be at least 5 dBA above ambient noise levels. These devices are highly directional in nature, and when in reverse, the trucks and the warning alarm would be directed towards the loading area and adjacent commercial-office structures. Audible warnings are, of course, intended to warn persons who are behind the vehicle when it is backing up, and could cause sleep disturbance if they occur during the nighttime (including early morning) hours near residential uses, a potentially significant noise impact. However, locating loading areas on the sides of commercial-office buildings that face away from

residential buildings to the extent feasible or designing loading areas with noise shielding (preferably enclosures) or restricting these activities to the daytime hours (7:00 a.m. to 8:00 p.m.), as specified in Mitigation Measure M-NO-4b: Design of Future Noise-Generating Uses, first bullet, would reduce the significant impact related to the potential for sleep disturbance of future residents from this noise source to a less-than-significant level.

Noise associated with parking cars includes engines starting and car doors slamming. Such noise can cause annoyance at adjacent residential uses if it is concentrated in one area (i.e., a surface parking lot is located adjacent to residences), and if it occurs during the evening or nighttime hours, it could cause sleep disturbance, a potentially significant impact. Parking for each project building is proposed to be located under the building (below-grade parking) or in a parking garage. These types of parking facilities could be designed to avoid or minimize the potential for such noise disturbance or annoyance at future residences with incorporation of appropriate noise-shielding measures into any future parking structures, as specified in Mitigation Measure M-NO-4b, second bullet. This would reduce significant noise conflicts from this future use to a less-than-significant level.

Noise associated with trash or refuse facilities for both future residential and commercial-office uses could disturb or annoy any future nearby residents, a significant impact. Such noise is typically associated with trash-dumping activities, operation of trash compactors and garbage truck collection activities (including truck noise, operation of motors that lift trash containers, banging of containers during trash collection activities, and audible warnings when trucks reverse).

As indicated in Impact NO-4 under "Stationary Equipment," p. 4.F.45, Section 2909 limits noise increases from fixed (stationary) mechanical equipment associated with each Proposed Project building (residential or commercial-office) to 5 dBA from residential sources and 8 dBA for commercial-office sources, and this requirement would limit the potential for noise compatibility problems. However, there are no similar code restrictions or noise limits that restrict activities such as these (i.e., parking structures, loading docks, and trash bins) that are related to commercial-office uses. Implementation of noise avoidance or minimization practices through the design of both future commercial-office and residential buildings, as specified in Mitigation Measures M-NO-6: Design of Future Noise-Sensitive Uses, pp. 4.F.70-4.F.71, and Mitigation Measure M-NO-4b would help reduce to a less-than-significant level the potential conflicts between future noise-generating uses and residential receptors and the potential for sleep disturbance. Mitigation Measure M-NO-6 would require a site-specific noise evaluation for each residential parcel or building to be developed to ensure that applicable interior noise standards are met, and the evaluation is required to account for planned commercial-office and open space uses in adjacent areas, future variations in Proposed Project build-out (building heights, location, and phasing), any changes in activities adjacent to or

near the Illinois Parcels or 28-Acre Site (given the Proposed Project's long build-out period), and any shielding provided by surrounding buildings that exist at the time of development. In addition, implementation of noise control measures in the design of noise-generating uses such as loading docks, trash enclosures, surface parking lots, and mechanical equipment evaluation, as specified in Mitigation Measure M-NO-4b, would ensure that new sources of noise associated with development of new non-residential uses are properly evaluated and potential sleep disturbance effects ameliorated, so that potential conflicts between new noise-generating uses and existing noise-sensitive uses would be avoided or reduced to a less-than-significant level.

Mitigation Measure M-NO-4a: Stationary Equipment Noise Controls

Noise attenuation measures shall be incorporated into all stationary equipment (including HVAC equipment and emergency generators) installed on buildings constructed on the Illinois Parcels and 28-Acre Site as well as into the below-grade or enclosed wastewater pump station as necessary to meet noise limits specified in Section 2909 of the Police Code.[32] Interior noise limits shall be met under both existing and future noise conditions, accounting for foreseeable changes in noise conditions in the future (i.e., changes in on-site building configurations). Noise attenuation measures could include provision of sound enclosures/barriers, addition of roof parapets to block noise, increasing setback distances from sensitive receptors, provision of louvered vent openings, location of vent openings away from adjacent commercial uses, and restriction of generator testing to the daytime hours.

Mitigation Measure M-NO-4b: Design of Future Noise-Generating Uses near Residential Uses

Future commercial/office and RALI uses shall be designed to minimize the potential for sleep disturbance at any future adjacent residential uses. Design approaches such as the following could be incorporated into future development plans to minimize the potential for noise conflicts of future uses on the project site:

- Design of Future Noise-Generating Commercial/Office and RALI Uses. To reduce potential conflicts between sensitive receptors and new noise-generating commercial or RALI uses located adjacent to these receptors, exterior facilities such as loading areas/docks, trash enclosures, and surface parking lots shall be located on the sides of buildings facing away from existing or planned sensitive receptors (residences or passive open space). If this is not feasible, these types of facilities shall be enclosed or equipped with appropriate noise shielding.
- Design of Future Above-Ground Parking Structure. If parking structures are constructed on Parcels C1 or C2, the sides of the parking structures facing adjacent or

[32] Under Section 2909 of the Police Code, stationary sources are not permitted to result in noise levels that exceed the existing ambient (L_{90}) noise level by more than 5 dBA on residential property, 8 dBA on commercial and industrial property, and 10 dBA on public property. Section 2909(d) states that no fixed noise source may cause the noise level measured inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dBA between 10:00 p.m. and 7:00 a.m. or 55 dBA between 7:00 a.m. and 10:00 p.m. with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

nearby existing or planned residential uses shall be designed to shield residential receptors from noise associated with parking cars.

Implementation of Mitigation Measures M-NO-4a and M-NO-4b would reduce noise compatibility impacts on noise-sensitive receptors from stationary sources to a less-than-significant level.

Impact NO-5: Operation of the Proposed Project would cause substantial permanent increases in ambient noise levels along some roadway segments in the project site vicinity. ***(Significant and Unavoidable with Mitigation)***

Operational Traffic Noise

Operation of the Proposed Project would result in permanent increases in ambient noise levels, primarily through project-related increases in traffic. As explained above under "Methodology for Analysis of Operational Impacts," pp. 4.F.27-4.F.28, for operational noise impacts, the following thresholds are applied to determine the significance of project-related traffic noise increases: (1) an increase of more than 5 dBA is considered a significant traffic noise increase; and (2) in places where the existing or resulting noise environment is "Conditionally Acceptable," "Conditionally Unacceptable," or "Unacceptable" for noise-sensitive uses based the San Francisco Land Use Compatibility Chart for Community Noise (Figure 4.F.3), any noise increase greater than 3 dBA is considered a significant traffic noise increase.

Noise modeling was completed to estimate existing (baseline) and future traffic noise levels along 79 road segments in the Pier 70 Mixed-Use District project area based on traffic volumes presented in the project's Traffic Impact Study.[33] Noise modeling results are presented in Table 4.F.10: Summary of Existing and Existing Plus Project Traffic Noise Levels. Traffic noise levels presented in this table have been modeled for the purpose of identifying the future incremental noise level increases attributable to project and cumulative development.

Table 4.F.10 indicates that Proposed Project implementation (under both the Maximum Residential and Maximum Commercial scenarios) would result in traffic noise increases ranging from 0 to 14.3 dBA on local roadways providing access to the site. Of the 79 road segments examined, traffic noise increases on all analyzed street segments would not exceed the above

[33] Fehr & Peers, *Pier 70 Mixed-Use District Project Transportation Impact Study*, December 2016.

Table 4.F.10: Summary of Existing and Existing Plus Project Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
Third Street	North of Harrison	67.1	67.4	0.4	67.5	0.4	Res/Com/Off
	Harrison to Bryant	67.8	68.1	0.3	68.1	0.4	Res/Com/Ind
	South of Bryant	67.5	68.0	0.5	68.1	0.6	Res/Com/Ind
	North of King	67.3	67.9	0.5	67.9	0.6	Res/Com
	King to Terry Francois	66.3	67.3	1.0	67.4	1.1	Ballpark/Res
	Terry Francois to Channel	65.6	66.8	1.1	66.9	1.2	Vacant/Parking
	Channel to Mission Rock	65.5	66.7	1.2	66.8	1.3	Res/Parking
	South of Mission Rock	65.3	66.6	1.3	66.7	1.4	UCSF/Inst/Res
	North of 16th	66.2	67.5	1.2	67.6	1.3	UCSF/Inst
	16th to Mariposa	66.4	67.9	1.5	67.9	1.5	Hospital/Ind
	Mariposa-20th	65.5	66.9	1.4	66.9	1.4	Res/Com/Ind
	20th to 22nd	66.0	67.3	1.3	67.5	1.4	Res/Com/Ind
	22nd to 23rd	66.4	67.9	1.5	58.8	1.5	Com/Res
	23rd to 25th	66.2	68.5	2.3	68.5	2.3	Ind
	25th to Cesar Chavez	66.3	68.1	1.8	68.0	1.8	Com/Ind
	South of Cesar Chavez	65.6	66.1	0.5	66.1	0.5	Ind

Table 4.F.10 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
16th Street	West of Mississippi	64.5	65.3	0.8	65.3	0.8	Com/Ind
	East of Mississippi	65.7	66.6	0.9	66.5	0.8	Com/Ind
	West of Owens	65.7	66.5	0.9	66.5	0.8	UCSF/Inst.
	East of Owens	65.9	66.8	0.9	66.8	0.9	UCSF/Inst.
	West of Third	65.4	66.9	1.5	66.8	1.4	UCSF/Hospital
	East of Third	60.0	62.2	2.3	62.3	2.3	UCSF/Inst.
18th Street	West of Arkansas	54.7	55.6	0.9	55.6	0.9	Res/Ind
	East of Arkansas	55.4	56.2	0.8	56.2	0.8	Res/Com
	West of Texas	58.3	58.8	0.4	58.8	0.4	Res/Com
	Texas to Pennsylvania	58.5	58.8	0.3	58.8	0.3	Res/Com
	East of Pennsylvania	59.0	60.4	1.3	60.2	1.1	Off/Com
	West of Indiana	59.0	60.4	1.3	60.2	1.1	Ind
	East of Indiana	59.2	61.2	2.0	61.2	2.0	Ind
20th Street	West of Third	58.9	60.0	1.1	60.0	1.1	Res/Ind
	East of Third	59.7	65.1	**5.5**	65.2	**5.5**	Ind
	West of Illinois	59.6	65.0	**5.5**	65.1	**5.5**	Ind
	East of Illinois	62.4	67.1	4.6	67.0	4.6	Ind

Table 4.F.10 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
22nd Street	West of Indiana	59.4	62.1	2.7	62.1	2.7	Ind
	Indiana to Tennessee	58.8	61.8	3.0	61.8	3.0	Res
	Tennessee to Third	58.4	61.6	**3.2**	61.6	**3.2**	Com/**Res**
	East of Third	58.5	66.9	**8.4**	66.7	**8.2**	Ind
	West of Illinois	58.1	66.9	**8.7**	66.7	**8.6**	Ind
	East of Illinois	51.1	65.4	**14.3**	65.4	**14.3**	Ind
23rd Street	West of Third	56.5	60.0	3.5	60.0	3.4	Ind
	East of Third	54.9	58.7	3.8	58.8	3.8	Ind
	West of Illinois	53.6	58.2	4.6	58.2	4.7	Ind
	East of Illinois	50.9	50.9	0.0	50.9	0.0	Ind
25th Street	West of Pennsylvania	56.5	56.5	0.0	56.5	0.0	Res
	East of Pennsylvania	59.4	61.7	2.3	61.8	2.3	Ind
	West of Indiana	59.3	61.6	2.3	61.7	2.4	Ind
	East of Indiana	59.4	61.7	2.3	61.8	2.3	Ind
	West of Third	57.4	61.7	4.4	62.0	4.6	Ind
	East of Third	53.0	57.9	4.8	58.4	5.4	Ind
	West of Illinois	54.0	58.2	4.2	58.7	4.7	Ind
	East of Illinois	49.5	49.5	0.0	49.5	0.0	Ind

Table 4.F.10 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
Cesar Chavez	West of Pennsylvania	65.1	66.4	1.3	66.4	1.3	Ind
	East of Pennsylvania	64.6	67.2	2.6	67.2	2.6	Ind
	West of Third	63.4	66.6	3.2	66.6	3.2	Ind
	East of Third	58.2	62.5	4.3	62.5	4.3	Ind
Arkansas Street	North of 18th	54.9	54.9	0.0	54.9	0.0	Res/Ind
	South of 18th	54.2	54.2	0.0	54.2	0.0	Res
Future Driveway	East of Illinois	NA	65.2	NA	65.2	NA	Ind
Illinois Street	North of Mariposa	56.8	59.9	3.1	59.9	3.1	Vacant/UCSF
	Mariposa-19th	59.9	62.9	3.0	62.9	3.0	Res/Com/Ind
	19th to 20th	60.4	63.4	3.0	63.4	3.0	Res/Com/Ind
	20th to Driveway	58.9	64.7	**5.7**	64.4	**5.5**	Ind
	Driveway to 22nd	58.9	65.9	**7.0**	65.8	**6.9**	Ind
	South of 22nd	57.6	63.2	**5.7**	63.4	**5.8**	Ind
Indiana Street	North of 22nd	54.1	54.1	0.0	54.1	0.0	Com/Ind
	South of 22nd	54.6	54.6	0.0	54.6	0.0	Ind
	North of 25th	58.6	60.3	1.7	60.6	1.9	Ind/Res
	South of 25th	57.5	57.5	0.0	57.5	0.0	Ind/Res

Table 4.F.10 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
Mariposa Street	West of I-280 Ramp	63.8	63.9	0.1	63.9	0.1	Ind/Res
	East of I-280 Ramp	65.6	65.9	0.4	66.0	0.4	Ind
	East of Indiana	63.4	64.1	0.7	64.1	0.7	Ind
	West of Third	62.5	63.3	0.8	63.3	0.8	Ind/Res
	East of Third	60.3	61.5	1.2	61.5	1.2	Ind
	West of Illinois	60.2	61.4	1.2	61.4	1.2	Ind
	East of Illinois	59.6	59.6	0.0	59.6	0.0	Ind
Tennessee Street	North of 22nd	53.4	53.4	0.0	53.4	0.0	Com/Res
	South of 22nd	49.7	49.7	0.0	49.7	0.0	Res/Com
Texas Street	North of 18th	52.6	52.6	0.0	52.6	0.0	Res
	South of 18th	51.5	51.5	0.0	51.5	0.0	Res

Notes: Noise levels may vary by up to one-tenth of a decibel due to rounding. Noise levels in **bold** exceed either of the following threshold increases when compared to baseline noise levels: (1) an increase of 5 dBA or more, or (2) an increase of 3 dBA or more in areas where the existing or resulting noise increase exceeds acceptable (or satisfactory) levels for the affected use (see Figure 4.F.3: San Francisco Land Use Compatibility Chart for Community Noise, p. 4.F.23).

Res: Residential; Com: Commercial; Off: Office; Ind: Industrial; Inst: Institutional; UCSF: University of California, San Francisco

Traffic noise modeling was completed using the Federal Highway Administration RD-77-108 model. Assumptions include: Travel speeds on all streets, 25 mph, except on 16th, Third, and Cesar Chavez, where the posted speed limit is 30 mph; Vehicle Mix: 98% Autos/1.5% Medium Trucks/0.5% Heavy Trucks; Day-Night Split: 76% Day (7:00 a.m. to 7:00 p.m.), 12% Evening (7:00 p.m. to 10:00 p.m.), and 12% Night (10:00 p.m. to 7:00 a.m.). Background noise levels due to traffic on other roadways (such as cross-streets or nearby freeways) and non-traffic-related activities are not reflected in these noise levels. Noise levels in this table are intended to indicate incremental noise changes due to project implementation and future growth. Since they do not include background noise levels, they may not necessarily reflect actual noise levels along these roadway segments if there are other nearby sources of noise. Changes between scenarios analyzed may not show change due to rounding in the noise modeling results.

Source: Orion Environmental Associates, 2016

thresholds except for the following, which would exceed traffic noise thresholds, resulting in significant impacts:

- 20th Street (east of Third Street to east of Illinois Street)
- 22nd Street (east of Tennessee Street to east of Illinois Street)
- Illinois Street (20th Street to south of 22nd Street)

These street segments either directly adjoin the project site or are within two blocks of the project site and provide direct access to the site. Based on the significance thresholds for traffic noise increases, these increases would be significant. As shown in Table 4.F.10, existing land uses located adjacent to all but one of the above-listed street segments are currently industrial, and such uses are not considered sensitive to traffic noise increases (i.e., not noise-sensitive receptors). There is one street segment, 22nd Street between Tennessee Street and Third Street where there are residential uses and the resulting noise level is estimated to slightly exceed 60 dBA (L_{dn} or CNEL) and the incremental increase attributable to the project would be 3.2 dB, 0.2 dB above the threshold.

The Proposed Project would include a shuttle service, operated and maintained by the Pier 70 TMA, to connect the Pier 70 Mixed-Use District to regional transit hubs. The primary goal of the proposed shuttle service at Pier 70 is to provide a first-mile / last-mile connection for transit riders traveling to or from the project site, particularly for riders needing to use frequent local and regional transit. These riders would be expected to take regional transit services operated by BART, Caltrain, Alameda-Contra Costa Transit (AC Transit), Golden Gate Transit, San Mateo County Transit (SamTrans), or other regional transit providers, but would need an additional connection to access these services when traveling to or from Pier 70. The exact structure of any shuttle service provided for the Proposed Project site has not been established and would depend on factors that are not known at this time. For planning and analysis purposes, two routes have been preliminarily identified; however, final service routes and stops would be determined based on rider feedback and demand, peak period traffic congestion on local streets, and BART and Caltrain schedules and service plans at specific stations. The two preliminary routes assumed for this analysis are:

- 22nd Street, Mississippi Street, and 16th Street to access the 22nd Street Caltrain Station and the 16th Street / Mission BART station; and
- Third Street, 16th Street, and King Street to access the Fourth and King Caltrain Station (with some trips extending to the Transbay Transit Center)).)

An increase in shuttle bus volumes along these routes would incrementally increase traffic noise levels along these streets. However, the degree of impact would depend on bus sizes, frequency of buses on an hourly basis, and hours of operation. The future shuttle bus schedule is not known

at this time, but it is anticipated that any shuttle trips would be relatively minor and adequately accounted for in the modeled traffic noise analysis above.

Reduction of project-related one-way traffic by 20 percent through transportation demand management measures required in Air Quality Mitigation Measure M-AQ-1f: Transportation Demand Management (see Section 4.G, Air Quality, pp. 4.G.47-4.G.50), could reduce noise levels by up to 1.0 dB. Therefore, implementation of M-AQ-1f would reduce the above significant impacts related to noise increases to less than significant with mitigation at all of the above street segments except for three road segments:

- 22nd Street from Third Street to Illinois Street;
- 22nd Street east of Illinois Street (on the project site); and
- Illinois Street from the future 21st Street and 22nd Street (adjacent to the project site).

The one-block section of 22nd Street located off-site is developed with industrial uses and therefore, does not have noise-sensitive receptors. Project residences located adjacent to the section of 22nd Street east of Illinois Street (where the highest increase [14 dBA] is projected to occur) and the section of Illinois Street between the proposed 21st and 22nd streets (where the next highest increase [7 dBA] is projected to occur) would not be adversely affected by future noise levels because noise attenuation measures would be incorporated into these units as necessary to ensure that interior noise levels are maintained at acceptable levels even with future traffic noise level increases (see Mitigation Measure M-NO-6: Design of Future Noise-Sensitive Uses. pp. 4.F.70-4.F.71). While this mitigation measure would reduce the effects of project-related traffic noise increases on the interior environment of future uses, the Proposed Project's traffic would still result in noise levels that would cause a substantial permanent increase in ambient noise levels. Therefore, this impact would remain significant and unavoidable with mitigation.

Reduction of project-related one-way traffic by 20 percent through transportation demand management measures required in Air Quality Mitigation Measure M-AQ-1f: Transportation Demand Management, would reduce project-related noise increases on local streets in the project area to less-than-significant levels except on three road segments. Therefore, significant impacts related to traffic noise increases on these three road segments would remain significant and unavoidable, even with implementation of Mitigation Measure M-AQ-1f.

Impact NO-6: The Proposed Project's occupants would be substantially affected by future noise levels on the site. ***(Less than Significant with Mitigation)***

As indicated above in Impacts NO-1 through NO-5, construction and operation of the Proposed Project would result in significant short- and long-term noise increases at the project site and its immediate vicinity. Therefore, the impact of these increases on future residents or users of the

project site is evaluated below.[34] Besides residential uses, future users of the site include open space/park/playground, commercial, and RALI uses. Open space/park/playground users in urban areas, commercial uses, and RALI uses are not considered to be sensitive to noise, and therefore, noise compatibility of these uses is not considered a CEQA impact. Noise compatibility of all proposed uses is evaluated in Table 4.F.11: Noise Compatibility by Parcel - Maximum Residential Scenario, and Table 4.F.12: Noise Compatibility by Parcel - Maximum Commercial Scenario, but where noise levels are considered Conditionally Acceptable for a proposed use, it is not considered a significant CEQA impact unless the use is residential; this is because residential uses are the only proposed land use that are noise-sensitive.

Compatibility with Future Noise Levels

As indicated above, the primary sources of future noise on the project site and its vicinity are from BAE Systems Ship Repair facility activities, earthmoving activities in the southwestern corner of the Illinois Parcel (PG&E Hoedown Yard), Existing Plus Project traffic noise on Illinois Street and other local streets, tonal noise from transformers at PG&E Potrero Substation, and loading dock activities along Illinois Street at the AIC Building. In addition to shipyard-related noise, there is continuous, distant background traffic noise from the I-280 freeway and other roadways. Passing Muni light rail and Caltrain rail operations also contribute to background noise. Long-term noise measurements collected in the project site and vicinity indicate that noise levels on the Illinois Parcels from these existing and future noise sources range from 64 to 68 dBA (L_{dn}), while noise levels in the southeastern portion of the 28-Acre Site range from 57 to 59 dBA (L_{dn}), which are somewhat quieter than those typical of light industrial/urban mixed-use locations. When measurement locations LT-3 and LT-4 are compared with measurement locations LT-1 and LT-2, existing intervening buildings (located both off- and on-site) appear to effectively shield some portions of the Mixed-Use District project site from noise generated by ship repair activities.

In general, the Maximum Residential Scenario would result in development of the greatest number of new residences, while the Maximum Commercial Scenario would result in development of the least number of residences. Both scenarios would result in development of the same amount of open space. Under both scenarios, multi-family residential units would be developed generally along the western and central portions of the project site (east side of Illinois Street, across from the AIC on Parcels PKN and PKS, and in the center of the site, Parcels D and E1, and in the central and eastern portions of the site (Parcels E2 and E3). Under both scenarios, Parcel C1 could be developed with residential, commercial, or parking uses and Parcel C2 could

[34] In *California Building Industry Association v. Bay Area Air Quality Management District*, the California Supreme Court concluded that CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents unless a proposed project risks exacerbating an existing environmental hazard or condition. In that case, the potential impact of such hazards on future residents or users should be evaluated.

be developed with residential or parking uses. Active rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on both of these parcels under both scenarios as well, if the parcels are developed with parking uses. However, under the Maximum Residential Scenario, residential uses would be developed along the southern boundary instead of commercial uses (Parcels HDY 1/HDY2, F/G, H1/H2) as well as in the center of the project site (Building 2). Noise levels are lowest in the southeast portion of the Mixed-Use District project site and the residential units in the center of the site would be shielded from BAE operational noise by commercial-office buildings to the north. Under both scenarios, residential uses on the western boundary of the project site would be subject to the highest noise levels from traffic on Illinois Street as well as activities at the AIC building and from operation of Potrero Substation.

The degree to which noise causes disturbance to people depends on noise frequencies, bandwidths, levels, and time patterns. In addition, higher frequencies, pure tones, and fluctuating noise levels tend to be more disturbing than lower frequencies, broadband, and constant-level noise. Although there are no standards or guidelines in the State Code or City noise guidelines that pertain to noise frequency or bandwidth, it is important to consider the noise character when considering the suitability of the project site for residential uses and potential for future noise conflicts.

Based on the data presented in Table 4.F.3, p. 4.F.11, the existing L_{dn} over most of the Mixed-Use District project site ranged from 60 to 69 dBA (L_{dn}) on the Illinois Parcels (LT-6 and LT-7), with slightly lower noise levels (57 to 59 dBA, L_{dn}) occurring in the southeastern corner of the 28-Acre Site (LT-5). A breakdown of noise compatibility by parcel and use for the Maximum Residential Scenario is presented in Table 4.F.11: Noise Compatibility by Parcel - Maximum Residential Scenario, while the same breakdown is provided for the Maximum Commercial Scenario in Table 4.F.12: Noise Compatibility by Parcel - Maximum Commercial Scenario.

PROPOSED RESIDENTIAL USES

The San Francisco Land Use Compatibility Chart for Community Noise (Figure 4.F.3, p. 4.F.23) indicates that noise levels up to 60 dBA (L_{dn}) are considered satisfactory (Acceptable) for residential uses, and no special noise insulation measures are required; between 60 dBA and 70 dBA (L_{dn}), noise levels are considered Conditionally Acceptable, where a detailed noise analysis is required and needed noise insulation features must be included in the design; above 65 dBA (L_{dn}), new residential construction is generally discouraged, but if it does proceed, a detailed noise analysis is required and needed noise insulation features must be included in the design.

As indicated in Tables 4.F.11 and 4.F.12, future noise levels at all Proposed Project parcels designated for residential use have existing noise levels that are considered Conditionally Acceptable, ranging between 60 dBA and 70 dBA (L_{dn}), with one exception: Illinois Parcels PKN

Table 4.F.11: Noise Compatibility by Parcel - Maximum Residential Scenario

Project Parcel/ Building	Max Res Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
28-Acre Site[2]					
Parcel A	Com-Office	60-66 dBA	60-70 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn).	N/A
Parcel B	Com-Office	60-66 dBA	65-69 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn).	N/A
Parcel C1	Com-Office or Residential	58-66 dBA	58-71 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn) except Conditionally Acceptable on north façade (71-75 dBA, Ldn) or Conditionally Acceptable for residential uses (>60 dBA, Ldn).	N/A or Yes (M-NO-6)
	or Parking		58-71 dBA	Parking use is not subject to City noise guidelines, but potential for disturbance of adjacent residents from noise associated with parking activities.	N/A
Parcel C2	Residential	58-66 dBA	58-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn).	Yes (M-NO-6)
	or Parking	58-66 dBA	58-70 dBA	Parking use is not subject to City noise guidelines, but potential for disturbance of adjacent residents from noise associated with parking activities.	N/A
Parcel D	Residential	66 dBA	66-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	Yes (M-NO-6)
Parcel E1	Residential	66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (M-NO-6)
Parcel E2	Residential	58-66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn).	Yes (M-NO-6)

Table 4.F.11 Continued

Project Parcel/ Building	Max Res Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
Parcel E3	Residential	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn).	Yes (M-NO-6)
Parcel F	Residential	58-66 dBA	58-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (M-NO-6)
Parcel G	Residential	58-66 dBA	58-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (M-NO-6)
Parcel H1	Residential	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (M-NO-6)
Parcel H2	Residential	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (M-NO-6)

Table 4.F.11 Continued

Project Parcel/ Building	Max Res Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
Building 2	Residential	66 dBA	66-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (M-NO-6)
Parcel E4	RALI	66 dBA	66-69 dBA	Acceptable for RALI uses (≤70 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A
Building 12	RALI	58-66 dBA	58-69 dBA	Acceptable for RALI uses (≤70 dBA, Ldn) but potential noise conflicts with adjacent residential uses.	N/A
Building 21	RALI	66 dBA	66 dBA	Acceptable for RALI uses (≤70 dBA, Ldn) but potential noise conflicts with adjacent residential uses.	N/A
Parcel C1 Rooftop	Parks / Sport Courts	58-66 dBA	58-71 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn) except Conditionally Acceptable only on C1 immediately adjacent to 21st Street (71-77.5 dBA, Ldn).	N/A
Parcel C2 Rooftop	Parks / Sport Courts	58-66 dBA	58-70 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn).	N/A
Waterfront Promenade	Open Space / Parks	58-66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, Ldn).	N/A
Waterfront Terrace	Open Space / Parks	66 dBA	58-68 dBA	Acceptable for water-related recreational uses (≤75 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A
Slipway Commons	Open Space / Parks	66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A
Building 12 Market Plaza/Square	Open Space / Parks	66 dBA	66-68 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A
Illinois Parcels[3]					
Parcel PKN	Residential	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn), and new residential construction generally discouraged on south façade	Yes (M-NO-6)

Table 4.F.11 Continued

Project Parcel/ Building	Max Res Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
Parcel PKS	Residential	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn), and new residential construction generally discouraged on north façade (>70 dBA, Ldn), but acceptable interior levels can still be achieved with supplemental noise-reduction measures. Project residences on west side would be subject to noise generated by AIC with measured nighttime Lmax up to 77 dBA, but averaging 70 dBA.	Yes (M-NO-6)
Hoedown Yard (HDY1/2)	Residential	62-64 dBA[4]	62-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Project residences on west side would be subject to noise generated by AIC (up to 77 dBA, Lmax, averaging 70 dBA, Lmax) to the west and Potrero Substationto the south (increased ambient of 10 to 13 dBA, Leq, at 200 feet).[5]	Yes (M-NO-6)
20th Street Plaza	Open Space / Parks	62-64 dBA	62-71 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn), but Conditionally Acceptable at the northern margin of the plaza adjacent to 20th Street.	N/A
Irish Hill Playground	Open Space / Parks	62-64 dBA	62-72 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn), but Conditionally Acceptable on north side adjacent to 21st Street (71-77.5 dBA, Ldn)	N/A

Notes: N/A = Not applicable and no mitigation required because it is not a noise-sensitive use. As indicated under "Attenuation of Noise," p. 4.F.4, closed windows reduce noise levels by approximately 25 dBA, while open windows reduce noise levels by about 15 dBA.

[1] Traffic noise levels were first estimated for each project roadway based on future estimated traffic volumes, and then adjusted for distance to the edge of the road rights-of-way to represent the maximum noise level at closest possible location of a building façade. Noise levels by façade are listed for each parcel and building on the project site in Appendix F, Project On-Site Noise Exposure by Parcel. The above table summarizes these estimates by presenting the lowest and highest combined noise levels for each parcel at the edge of the adjacent or closest road rights-of-way.

[2] All 28-Acre Site parcels except existing Buildings 2, 12, and 21 would be permitted to include accessory parking. Also RALI uses would be allowed on the ground floor of Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, and H2.

[3] Retail/Restaurant uses would be allowed on the ground floor and accessory parking on all four parcels.

[4] Ambient noise levels for Parcel HDY are estimated based on measurements collected along Illinois Street to the north because measurements at Parcel HDY included noise from heavy equipment operations associated with the existing PG&E corporation yard activities in the Hoedown Yard. These operations would cease on this parcel when this parcel is redeveloped as part of project implementation, but transformer noise from Potrero Substation would continue.

[5] When measured L90 levels between midnight and 4:00 a.m. are compared between LT-6 and LT-7 (same distance to Illinois Street except LT-7 is located 200 feet from Potrero Substation to the south), the difference in nighttime ambient was 10 to 13 dBA, which could be attributable to Potrero Substation.

Source: Orion Environmental Associates, 2016

Table 4.F.12: Noise Compatibility by Parcel - Maximum Commercial Scenario

Project Parcel/ Building	Max Com Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
28-Acre Site[2]					
Parcel A	Com-Office	60-66 dBA	60-70 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn).	N/A
Parcel B	Com-Office	60-66 dBA	65-69 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn).	N/A
Parcel C1	Com-Office	58-66 dBA	58-71 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn) except Conditionally Acceptable on north façade (70-75 dBA, Ldn).	N/A
	or Parking		58-71 dBA	Parking use not subject to City noise guidelines, but potential noise conflicts with adjacent residential uses.	N/A
Parcel C2	Residential	58-66 dBA	58-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn).	Yes (M-NO-6)
	or Parking	58-66 dBA	58-70 dBA	Parking use not subject to City noise guidelines, but potential noise conflicts with adjacent residential uses.	N/A
Parcel D	Residential	66 dBA	66-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	Yes (M-NO-6)
Parcel E1	Residential	66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	Yes (M-NO-6)
Parcel E2	Residential	58-66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn).	Yes (M-NO-6)
Parcel E3	Residential	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn).	Yes (M-NO-6)

Table 4.F.12 Continued

Project Parcel/ Building	Max Com Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
Parcel F	Com-Office	58-66 dBA	58-70 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel G	Com-Office	58-66 dBA	58-69 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel H1	Com-Office	58-66 dBA	58-68 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel H2	Com-Office	58-66 dBA	58-68 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Building 2	Com-Office	66 dBA	66-70 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel E4	RALI	66 dBA	66-69 dBA	Acceptable for RALI uses (≤70 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A

Table 4.F.12 Continued

Project Parcel/ Building	Max Com Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
Parcel C1 Rooftop	Parks / Sport Courts	58-66 dBA	58-71 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn) except Conditionally Acceptable only on C1 immediately adjacent to 21st Street (71-77.5 dBA, Ldn).	N/A
Parcel C2 Rooftop	Parks / Sport Courts	58-66 dBA	58-70 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn).	N/A
Waterfront Promenade	Open Space / Parks	58-66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, Ldn).	N/A
Waterfront Terrace	Open Space / Parks	66 dBA	58-68 dBA	Acceptable for water-related recreational uses (≤75 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A
Slipway Commons	Open Space / Parks	66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A
Building 12 Market Plaza/Square	Open Space / Parks	66 dBA	66-68 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn), but potential noise conflicts with adjacent residential uses.	N/A
Illinois Parcels[3]					
Parcel PKN	Residential	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn), and new residential construction generally discouraged on south façade (>70 dBA, Ldn), but acceptable interior levels can still be achieved with supplemental noise-reduction measures. Project residences on the west side would be subject to noise generated by AIC with maximum exterior noise levels up to 77 dBA (Lmax), averaging 70 dBA (Lmax) during the nighttime hours.	Yes (M-NO-6)
Parcel PKS	Residential	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, Ldn), and new construction generally discouraged on north façade (>70 dBA, Ldn), but acceptable interior levels can still be achieved with supplemental noise-reduction measures. Project residences on west side would be subject to noise generated by AIC with maximum exterior noise levels up to 77 dBA (Lmax), averaging 70 dBA (Lmax) during the nighttime hours.	Yes (M-NO-6)
Hoedown Yard (HDY1/2)	Com-Office	62-64 dBA[4]	62-70 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn). Project commercial uses on west side would be subject to noise generated by AIC (up to 77 dBA (Lmax), averaging 70 dBA (Lmax) during the nighttime hours) to the west and PG&E transformers to the south (increased ambient of 10 to 13 dBA (Leq) at 200 feet during the night[5]), no noise compatibility problems since commercial uses are not considered noise-sensitive.	N/A

Table 4.F.12 Continued

Project Parcel/ Building	Max Com Scenario Proposed Use	Existing Noise Level (Ldn)	With Future Traffic Noise Increases (Ldn)[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 4.F.3)	Noise Mitigation Needed
20th Street Plaza	Open Space / Parks	62-64 dBA	62-71 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn) except Conditionally Acceptable adjacent to 20th Street (70-77.5 dBA, Ldn).	N/A
Irish Hill Playground	Open Space / Parks	62-64 dBA	62-72 dBA	Acceptable for playgrounds/parks (≤70 dBA, Ldn) but Conditionally Acceptable adjacent to 21st Street and Illinois Street (70-77.5 dBA, Ldn).	N/A

Notes: N/A = Not applicable and no mitigation required because it is not a noise-sensitive use. As indicated under "Attenuation of Noise," p. 4.F.4, closed windows reduce noise levels by approximately 25 dBA, while open windows reduce noise levels by about 15 dBA.

[1] Traffic noise levels were first estimated for each project roadway based on future estimated traffic volumes, and then adjusted for distance to the edge of the road rights-of-way to represent the maximum noise level at closest possible location of a building façade. Noise levels by façade are listed for each parcel and building on the project site in Appendix F, Project On-Site Noise Exposure by Parcel. The above table summarizes these estimates by presenting the lowest and highest combined noise levels for each parcel at the edge of the adjacent or closest road rights-of-way.

[2] All 28-Acre Site parcels except existing Buildings 2, 12, and 21 would be permitted to include accessory parking. Also RALI uses would be allowed on the ground floor of Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, and H2.

[3] Retail/Restaurant uses would be allowed on the ground floor and accessory parking on all four parcels.

[4] Ambient noise levels for Parcel HDY are estimated based on measurements collected along Illinois to the north because measurements at Parcel HDY included noise from heavy equipment operations associated with the existing PG&E corporation yard activities. These operations would cease on this parcel when this parcel is redeveloped as part of project implementation, but transformer noise from Potrero Substation would continue.

[5] When measured L90 levels between midnight and 4:00 a.m. are compared between LT-6 and LT-7 (same distance to Illinois except LT-7 is located 200 feet from Potrero Substation to the south), the difference in nighttime ambient was 10 to 13 dBA, which could be attributable to Potrero Substation.

Source: Orion Environmental Associates, 2016

and PKS, where future noise levels are estimated to be slightly higher (72 dBA, L_{dn}) at 19 feet from the centerline of the future 21st Street. Except for the residential units that would face 21st Street on these two parcels, it is expected that proposed residential uses on the project site could be designed to meet the 45-dBA (L_{dn} or CNEL) interior noise standard specified by Title 24 with incorporation of common noise attenuation measures. Examples of common noise attenuation measures include selecting glazing with higher noise reduction, improving exterior wall construction, and adapting the layout of interior spaces and/or location of windows. Therefore, compliance with Title 24's interior standard would reduce noise compatibility impacts to less-than-significant levels at all residential units except those subject to noise levels above 70 dBA (L_{dn}). Within the project site, residential units facing the future 21st Street on Parcels PKN and PKS would be subject to noise levels of up to 72 dBA (L_{dn}), resulting in a significant impact. With incorporation of noise attenuation measures into the project design as necessary in order to meet the 45-dBA interior noise standard, as specified in Mitigation Measure M-NO-6, this impact would be reduced to a less-than-significant level.

Historic Building 2 is proposed to be rehabilitated in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Noise levels measured just north of this building (LT-2) were 66 dBA (L_{dn}). When future traffic noise levels are added to existing ambient noise levels, future noise levels at the edges of road rights-of way are estimated to range between 66 and 70 dBA (L_{dn}). This building is proposed for residential uses under the Maximum Residential Scenario. When compared to the City's compatibility guidelines for residential uses (Figure 4.F.3, p. 4.F.23), future noise levels in the vicinity of this building are considered to be Conditionally Acceptable, a significant impact. With incorporation of noise attenuation approaches into the project design as necessary in order to meet the 45-dBA interior noise standard of Title 24, as specified in Mitigation Measure M-NO-6, this impact would be reduced to a less-than-significant level.

The applicant would be required to demonstrate that the 45-dBA (L_{dn} or CNEL) interior noise standard specified by Title 24 would be met at all project residences, and additional noise attenuation measures are required to be incorporated into the project design as necessary to meet this interior standard, but also address potential sleep disturbance effects on affected parcels (as indicated in Tables 4.F.11 and 4.F.12) from adjacent or nearby industrial activities. It is noted that on-site noise levels could increase with proposed building demolition (as noted in Tables 4.F.11 and 4.F.12), but also decrease in the future with project implementation if existing heavy equipment operations at the Hoedown Yard cease and Proposed Project buildings are up to 90 feet tall in the northern portion of the 28-Acre Site. Such building heights could help partially shield the rest of the site from noise generated by the BAE Systems Ship Repair facility (i.e., BAE boilers and generators). Such future noise reductions, however, would ultimately depend on

the final locations and heights of proposed buildings but could reduce the extent of noise attenuation required at some residential units.

PROPOSED OPEN SPACE/PARK/PLAYGROUND USES

In urban environments, playgrounds and parks (active recreation areas) as well as open space areas in urban areas are not considered noise-sensitive uses, and therefore, the following analysis of noise compatibility is provided for informational purposes only. Under the City's compatibility guidelines for playgrounds and parks (Figure 4.F.3), noise levels up to 70 dBA (L_{dn}) are considered to be Acceptable, and no noise attenuation approaches need to be implemented. As indicated in Tables 4.F.11 and 4.F.12, future noise levels at all but three Proposed Project parcels designated for open space/park/playground uses are estimated to range between 60 dBA and 70 dBA (L_{dn}). Such levels are considered Acceptable for these outdoor uses. Future noise levels under both scenarios could reach 71 or 72 dBA along the edges of the Parcel C1 Rooftop, 20th Street Plaza, and Irish Hill Playground (located adjacent to 20th and 21st streets), and such levels are considered Conditionally Acceptable. While noise levels exceeding 70 dBA (L_{dn}) are attributable to traffic noise on these streets, they would only occur along the margins of the open spaces/parks located adjacent to these streets, not the main park or playground areas. Park users could access quieter areas within these parks (away from adjacent streets), and noise levels would be considered generally acceptable at proposed open space/park/playground areas.

Mitigation Measure M-NO-6: Design of Future Noise-Sensitive Uses

Prior to issuance of a building permit for vertical construction of specific residential building design on each parcel, a noise study shall be conducted by a qualified acoustician, who shall determine the need to incorporate noise attenuation measures into the building design in order to meet Title 24's interior noise limit for residential uses as well as the City's (Article 29, Section 2909(d)) 45-dBA (L_{dn}) interior noise limit for residential uses. This evaluation shall account for noise shielding by buildings existing at the time of the proposal, potential increases in ambient noise levels resulting from the removal of buildings that are planned to be demolished, all planned commercial or open space uses in adjacent areas, any known variations in project build-out that have or will occur (building heights, location, and phasing), any changes in activities adjacent to or near the Illinois Parcels or 28-Acre Site (given the Proposed Project's long build-out period), any new shielding benefits provided by surrounding buildings that exist at the time of development, future cumulative traffic noise increases on adjacent roadways, existing and planned stationary sources (i.e., emergency generators, HVAC, etc.), and future noise increases from all known cumulative projects located with direct line-of-sight to the project building.

To minimize the potential for sleep disturbance effects from tonal noise or nighttime noise events associated with nearby industrial uses, predicted noise levels at each project building shall account for 24/7 operation of the BAE Systems Ship Repair facility, 24/7 transformer noise at Potrero Substation (if it remains an open air facility), and industrial

activities at the AIC, to the extent such use(s) are in operation at the time the analysis is conducted.

Noise reduction strategies such as the following could be incorporated into the project design as necessary to meet Title 24 interior limit and minimize the potential for sleep disturbance from adjacent industrial uses:

- Orient bedrooms away from major noise sources (i.e., major streets, open space/recreation areas where special events would occur, and existing adjacent industrial uses, including AIC, Potrero Substation, and the BAE site) and/or provide additional enhanced noise insulation features (higher STC ratings) or mechanical ventilation to minimize the effects of maximum instantaneous noise levels generated by these uses even though there is no code requirement to reduce L_{max} noise levels. Such measures shall be implemented on Parcels D and E1 (both scenarios), Building 2 (Maximum Residential Scenario only), Parcels PKN (both scenarios), PKS (both scenarios), and HDY (Maximum Residential Scenario only);
- Utilize enhanced exterior wall and roof-ceiling assemblies (with higher STC ratings), including increased insulation;
- Utilize windows with higher STC / Outdoor/Indoor Transmission Class (OITC) ratings;
- Employ architectural sound barriers as part of courtyards or building open space to maximize building shielding effects, and locate living spaces/bedrooms toward courtyards wherever possible; and
- Locate interior hallways (accessing residential units) adjacent to noisy streets or existing/planned industrial or commercial development.

Implementation of Mitigation Measure M-NO-6 would reduce noise compatibility impacts on project residences to a less-than-significant level.

Impact NO-7: The Proposed Project's special events would result in substantial periodic, temporary noise increases. ***(Less than Significant with Mitigation)***

The Proposed Project would include development of a number of public open spaces. The open space planning chapter in the *Pier 70 SUD Design for Development* provides concepts and approximate hypothetical site plans, but these concepts and site plans would be further developed. Under the conceptual ideas, the Market Square open space area is proposed to have open-air markets, market stalls, small performances, and gatherings (between Buildings 2, 12, and Parcel D). Community gatherings (i.e., festivals, performances, and nighttime cultural events) are proposed in the Slipways Common open space area (between Parcels E1, E2, E3, E4, and Building 21). A café terrace, social lawn, beer garden, food/beverage operations, and picnic area are proposed in the Waterfront Terrace open space area. Viewing pavilions proposed in the Waterfront Promenade would accommodate a variety of public program uses such as cultural events and gatherings. Typical events, occurring up to an estimated three times a month, could have attendance of approximately 500 to 750 people, while larger-scale events, occurring

approximately four times per year, could have attendance up to 5,000 people. The Waterfront Promenade would also include pedestrian and bike trails, café terrace, and passive recreation. The Irish Hill Playground (between Parcels PKS, HDY, C1, and C2) would have playground facilities. If Parcels C1 and C2 are built as district parking, there would be public open space on the rooftops. While final plans for this open space area have not been developed, potential uses for this open space include sport courts and play fields, urban agriculture plots, seating, and observational terrace areas.

Residential uses are proposed to be developed adjacent to the Irish Hill Playground (Parcel PKS under both scenarios and Parcel HDY under the Maximum Residential Scenario). Residential uses would also be developed adjacent to the Market Square open space area (Building 2 and Parcel D under the Maximum Residential Scenario, but only Parcel D under the Maximum Commercial Scenario). Residential uses would also be proposed adjacent to Slipway Commons, where events would be held during the day and evening (Parcels E1, E2, and E3 under both scenarios), as well as adjacent to the Waterfront Promenade, where cultural events would be held during the day and evening (Parcel H2 under Maximum Residential Scenario). RALI or commercial-office uses are proposed adjacent to the Waterfront Terrace open space area (Parcels B2 and E4 under both scenarios), where there would be more intensive outdoor uses (a beer garden and food/beverage operations).

The proximity of future residential uses to these types of open space uses would pose the potential for Proposed Project residents to be disturbed or annoyed by noise from outdoor active recreation/open space activities. Noise levels associated with the proposed café terrace, social lawn, beer garden, food/beverage operations, picnic areas and the playground would be typical of an urban, mixed-use residential area and would be less than significant in regards to compatibility with nearby sensitive receptors. The potential noise conflicts would be greatest where amplified sound systems would be used and/or events occur during the more noise-sensitive late evening/nighttime hours when sleep disturbance could occur.

As discussed above under Local Regulations and Guidelines, promoters of any proposed outdoor events on the site's outdoor plaza that would use amplified sound or music would be required to obtain a permit from the City prior to the event. Section 1060.1 of the Police Code requires a permit to conduct, operate, or maintain a place of entertainment, limited live performance locale or one-time event within the City and County of San Francisco. Concerts in the proposed open spaces would require the promoter to obtain a Limited Live Performance Permit from the San Francisco Entertainment Commission. This permit process requires a public hearing and includes a requirement for neighborhood outreach. Article 1, Section 47.2 of the Police Code, while generally focused on truck-mounted amplification equipment, regulates the use of any sound amplifying equipment, whether truck-mounted or otherwise. Hours of operation are restricted to

between 9:00 a.m. and 10:00 p.m., unless permitted by the San Francisco Entertainment Commission.

Due to uncertainties as to the nature and extent of future outdoor events at the project site, the use of amplified sound equipment could still have the potential for significant noise impacts to nearby sensitive receptors in excess of standards established in the San Francisco General Plan or San Francisco Noise Ordinance. Implementation of Mitigation Measure M-NO-7: Noise Control Plan for Outdoor Amplified Sound, shown below, would ensure that sound levels generated by amplified equipment would be consistent with Section 2909 of the City's Police Code, which establishes a not-to-exceed (except through a variance) noise standard for fixed sources of noise and from events subject to regulation by the Entertainment Commission. Event noise generated from a public property would be limited to 10 dBA above the local ambient at a distance of 25 feet or more; event noise generated from a commercial property would be limited to 8 dBA above the local ambient at any point outside the property plane. In addition, compliance with Section 2909(d) would limit noise from outdoor activities in residential interiors to 45 dBA between 10:00 p.m. and 7:00 a.m. or 55 dBA between 7:00 a.m. and 10:00 p.m. with windows open. Any variance to these limits granted pursuant to Section 2910 of the Police Code could only be approved through the Entertainment Commission hearing process required by Section 1060.1 of the Police Code.

Therefore, with implementation of Mitigation Measure M-NO-7: Noise Control Plan for Outdoor Amplified Sound, and with compliance with Sections 47.2, 1060.1 and 2909 of the Police Code, periodic and temporary noise increases associated with special events would be less than significant.

Mitigation Measure M-NO-7: Noise Control Plan for Special Outdoor Amplified Sound

The project sponsor shall develop and implement a Noise Control Plan for operations at the proposed entertainment venues to reduce the potential for noise impacts from public address and/or amplified music. This Noise Control Plan shall contain the following elements:

- The project sponsor shall comply with noise controls and restrictions in applicable entertainment permit requirements for outdoor concerts.
- Speaker systems shall be directed away from the nearest sensitive receptors to the degree feasible.
- Outdoor speaker systems shall be operated consistent with the restrictions of Section 2909 of the San Francisco Police Code, and conform to a performance standard of 8 dBA and dBC over existing ambient L_{90} noise levels at the nearest residential use.

Impact NO-8: Operation of the Proposed Project would not expose people and structures to or generate excessive groundborne vibration or noise levels. *(Less than Significant)*

Operational-related groundborne vibration is not a common environmental problem and even large vehicles (e.g., trucks and buses) do not generally result in perceptible vibration. Therefore, no significant long-term vibration effects are expected to be associated with proposed residential, commercial, and RALI uses under both the Maximum Residential and Maximum Commercial scenarios, and no mitigation is necessary.

Operation of pumps at the below-ground or enclosed wastewater pump station would have the potential to generate groundborne vibration that could cause sleep disturbance during the more sensitive nighttime hours if residential receptors are located nearby. However, vibration generated by pump station equipment can affect other equipment within the pump station if vibration levels are not controlled adequately. Therefore, controls that are already incorporated into the design to prevent damage to pump station equipment from excessive vibration would also be sufficient to avoid operational vibration levels from causing sleep disturbance at the closest residential receptors (located a minimum of 375 feet away) and cosmetic damage of adjacent project structures (located at least 75 feet away). Therefore, potential operational vibration effects associated with the proposed wastewater pump station would be less than significant and no mitigation is necessary.

CUMULATIVE IMPACTS

Cumulative construction noise impacts are assessed based on a review of the foreseeable future projects that are located adjacent or in close enough proximity to the project site so as to affect the same noise-sensitive receptors (those located adjacent to or near the project site or along shared construction haul routes), and under construction at the same time as the Proposed Project (see Section 4.A, Introduction to Chapter 4, pp. 4.A.12-4.A.17).

Cumulative operational noise impacts are assessed by modeling cumulative plus project traffic noise levels and comparing the results with existing modeled traffic noise levels to the criteria discussed above.

The geographic scope of potential cumulative noise impacts encompasses the project site and its immediate vicinity for cumulative construction-related noise impacts as well as road segments adjacent to intersections analyzed in the Transportation Impact Study (see Figure 4.E.1: Transportation Study Area and Study Intersections, in Section 4.E, Transportation and Circulation, p. 4.E.2, for study intersection locations). As noted in Section 4.E, p. 4.E.112, the cumulative traffic analysis utilizes a projections approach and the cumulative traffic noise analysis likewise uses a projections approach because it uses these traffic volumes to estimate

operational traffic noise increases. A list-based approach is also used to evaluate cumulative construction-related noise increases because cumulative impacts can occur if construction projects in proximity to each other occur simultaneously and affect the same noise-sensitive receptors that are located adjacent to or near the project sites or shared construction haul routes.

Construction

Impact C-NO-1: Construction of the Proposed Project combined with cumulative construction noise in the project area would not cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction. ***(Less than Significant)***

In general, the potential for cumulative noise increases associated with Proposed Project construction would result if there are any other projects located nearby that could be constructed at the same time or substantially extend the duration of construction noise at any nearby sensitive receptors. The closest sensitive receptor is located approximately 140 feet northwest of the site (616 20th Street). The closest cumulative projects where concurrent construction could cumulatively increase noise levels in the vicinity of the project site would be the BAE Lease Renewal project, located immediately north of the 28-Acre Site, approximately 200 feet north of the Illinois Parcels, and Crane Cove Park, located north of the 20th Street Historic Core project and BAE Lease Renewal project. BAE improvements would involve mostly routine maintenance and repair work and are not expected to generate noise levels higher than normal operations. These activities are expected to occur every 18 months for 6 weeks at a time over the next 7 years. Crane Cove Park would involve primarily park improvements. Phase 1 of Crane Cove Park would be completed in January 2018, which is approximately when construction of the Proposed Project would start, minimizing the potential for overlapping construction activities. Phase 2 of Crane Cove Park has not been determined, but could occur between August 2026 to December 2028, which could overlap with Phase 5 of the Proposed Project (2027 to 2029). However, Phase 5 construction would occur in the southern margin of the 28-Acre Site, which is the most distant portion of the site from Crane Cove Park, and such separation would minimize the potential for cumulative construction noise increases. Given the limited duration and scope of potential concurrent construction activities associated with these two cumulative projects (i.e., neither would involve the extended duration of construction and pile driving activities like those associated with Project construction), cumulative noise impacts associated with any overlapping construction would be less than significant.

Construction activities associated with the Proposed Project in combination with construction of these and other cumulative projects in the vicinity (such as the Golden State Warriors Event Center and Mixed Use Development, Seawall Lot 337/Pier 48, and various smaller projects located in the neighborhoods to the west of the site) could result in cumulative increases in construction-related traffic on construction routes such as Illinois Street, 25th Street, or Cesar

Chavez Street. These are the streets that provide access to/from the I-280 and SR 101 freeways. As these streets already serve as truck routes, they have higher ambient noise levels than local residential streets. Given that these truck routes have limited residential or other sensitive receptor land uses located adjacent to these routes, cumulative traffic increases on these routes are not expected to substantially increase ambient noise levels in the vicinity of these routes for sensitive receptors and this cumulative impact would be less than significant. Therefore, the Proposed Project's contribution would not be cumulatively considerable.

Prior to Proposed Project implementation, Building 117 is expected to be demolished as part of the 20th Street Historic Core project. Demolition of this building could temporarily increase baseline noise levels on the project site from traffic on Illinois Street because it currently serves as a barrier and interrupts the line-of-sight between the project site and Illinois Street.[35] However, proposed construction of structures on Parcels C1 and C2 would restore this barrier effect for parcels and buildings to the east. In addition, retention of Buildings 2 and 12 would help to further block shipyard noise from parcels to the west and south (Parcels PSK, HDY, C1, C2, F, and G). Therefore, changes in the noise environment on the project site as a result of cumulative building demolition would not adversely affect future on-site residents.

Operation

Impact C-NO-2: Operation of the Proposed Project, in combination with other cumulative development would cause a substantial permanent increase in ambient noise levels in the project vicinity. ***(Significant and Unavoidable with Mitigation)***

As indicated in Table 4.F.13: Summary of Cumulative Traffic Noise Levels, when traffic noise increases related to the Proposed Project (under both the Maximum Residential and Maximum Commercial scenarios) are added to future traffic noise increases resulting from cumulative development, the Proposed Project would add 0 to 8.0 dBA (L_{dn}) to estimated cumulative noise increases under both scenarios. Of the 79 road segments examined, the Proposed Project would contribute considerably to cumulative traffic noise increases along the following street segments because cumulative noise increases would exceed significance thresholds for traffic noise increases):

- 22nd Street (east of Third Street to east of Illinois Street)
- Illinois Street (Mariposa Street to 22nd Street)

[35] Increased baseline would result in lower impacts; therefore, not accounting for this increased baseline is a conservative approach.

Table 4.F.13: Summary of Cumulative Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
Third Street	North of Harrison	67.1	67.3	67.7	0.6	0.4	67.8	0.7	0.4	Res/Com/Off
	Harrison to Bryant	67.8	68.3	68.6	0.8	0.3	68.7	0.9	0.3	Res/Com/Ind
	South of Bryant	67.5	67.9	68.3	0.8	0.4	68.4	0.9	0.5	Res/Com/Ind
	North of King	67.3	68.2	68.6	1.3	0.4	68.7	1.3	0.5	Res/Com
	King to Terry Francois	66.3	67.7	68.5	2.2	0.7	68.5	2.2	0.8	Ballpark/Res
	Terry Francois to Channel	65.6	67.4	68.2	2.6	0.8	68.3	2.7	0.9	Vacant/Parking
	Channel to Mission Rock	65.5	68.0	68.8	**3.3**	0.7	68.8	**3.4**	0.8	**Res**/Parking
	South of Mission Rock	65.3	67.7	68.5	**3.2**	0.8	68.6	**3.3**	0.9	UCSF/Inst/**Res**
	North of 16th	66.2	67.9	68.8	2.5	0.9	68.8	2.6	0.9	UCSF/Inst
	16th to Mariposa	66.4	67.5	68.7	2.3	1.2	68.7	2.3	1.2	Hospital/Ind
	Mariposa-20th	65.5	67.4	68.4	2.8	1.0	68.3	2.8	0.9	Res/Com/Ind
	20th to 22nd	66.0	68.4	69.2	**3.1**	0.8	69.3	**3.2**	0.9	**Res**/Com/Ind
	22nd to 23rd	66.4	68.2	69.9	**3.5**	1.7	69.8	**3.4**	1.6	Com/**Res**
	23rd to 25th	66.2	67.4	69.2	3.0	1.9	69.2	3.0	1.8	Ind
	25th to Cesar Chavez	66.3	67.7	69.1	2.8	1.4	69.0	2.8	1.3	Com/Ind

Table 4.F.13 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
	South of Cesar Chavez	65.6	67.1	67.5	1.9	0.3	67.5	1.9	0.3	Ind
16th Street	West of Mississippi	64.5	65.9	66.5	2.0	0.6	66.5	2.0	0.6	Com/Ind
	East of Mississippi	65.7	66.8	67.5	1.8	0.7	67.5	1.8	0.7	Com/Ind
	West of Owens	65.7	66.9	67.6	1.9	0.7	67.5	1.9	0.6	UCSF/Inst.
	East of Owens	65.9	66.3	67.2	1.3	0.9	67.1	1.2	0.8	UCSF/Inst.
	West of Third	65.4	66.6	67.8	2.4	1.2	67.7	2.3	1.1	UCSF/Hospital
	East of Third	60.0	63.1	64.3	4.4	1.3	64.3	4.4	1.3	UCSF/Inst.
18th Street	West of Arkansas	54.7	54.9	55.8	1.1	0.9	55.8	1.1	0.9	Res/Ind
	East of Arkansas	55.4	56.6	57.2	1.9	0.6	57.2	1.9	0.6	Res/Com
	West of Texas	58.3	59.1	59.5	1.1	0.4	59.5	1.1	0.4	Res/Com
	Texas to Pennsylvania	58.5	59.1	59.4	0.9	0.3	59.4	0.9	0.3	Res/Com
	East of Pennsylvania	59.0	59.9	61.0	2.0	1.1	60.8	1.8	0.9	Off/Com
	West of Indiana	59.0	59.9	61.0	2.0	1.1	60.8	1.8	0.9	Ind
	East of Indiana	59.2	60.7	62.3	3.1	1.5	62.2	3.0	1.5	Ind
20th Street	West of Third	58.9	59.8	60.7	1.8	0.9	60.7	1.8	0.9	Res/School/Ind
	East of Third	59.7	61.8	65.9	**6.2**	4.1	65.9	**6.2**	4.1	Ind

Table 4.F.13 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
	West of Illinois	59.6	62.8	66.2	**6.7**	3.4	66.3	**6.7**	3.4	Ind
	East of Illinois	62.4	64.5	67.9	**5.5**	3.4	67.9	**5.5**	3.4	Ind
22nd Street	West of Indiana	59.4	61.8	63.5	4.1	1.8	63.5	4.1	1.8	Ind
	Indiana to Tennessee	58.8	61.1	63.1	4.4	2.0	63.1	4.4	2.0	Res
	Tennessee to Third	58.4	59.8	62.3	**4.0**	2.5	62.3	**4.0**	2.5	Com/**Res**
	East of Third	58.5	59.6	67.1	**8.6**	**7.5**	66.9	**8.4**	**7.3**	Ind
	West of Illinois	58.1	59.0	67.0	**8.9**	**8.0**	66.8	**8.7**	**7.8**	Ind
	East of Illinois	51.1	59.5	66.3	**15.2**	**6.7**	66.3	**15.2**	**6.7**	Ind
23rd Street	West of Third	56.5	58.4	60.9	4.4	2.6	60.9	4.4	2.5	Ind
	East of Third	54.9	58.3	60.5	**5.5**	2.1	60.5	**5.5**	2.2	Ind
	West of Illinois	53.6	58.4	60.5	**6.9**	2.1	60.5	**6.9**	2.1	Ind
	East of Illinois	50.9	53.2	53.2	2.3	0.0	53.2	2.3	0.0	Ind
25th Street	West of Pennsylvania	56.5	59.5	59.5	3.0	0.0	59.5	3.0	0.0	Res
	East of Pennsylvania	59.4	60.7	62.5	3.1	1.8	62.6	3.1	1.9	Ind
	West of Indiana	59.3	60.7	62.5	3.2	1.8	62.6	3.2	1.9	Ind
	East of Indiana	59.4	60.7	62.5	3.1	1.8	62.6	3.1	1.9	Ind
	West of Third	57.4	59.6	62.7	**5.3**	3.1	62.9	**5.5**	3.3	Ind

Table 4.F.13 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
	East of Third	53.0	57.7	60.0	**7.0**	2.3	60.3	**7.3**	2.6	Ind
	West of Illinois	54.0	57.7	60.0	**6.0**	2.3	60.3	**6.3**	2.6	Ind
	East of Illinois	49.5	53.7	53.7	4.1	0.0	53.7	4.1	0.0	Ind
Cesar Chavez	West of Pennsylvania	65.1	65.5	66.7	1.6	1.2	66.7	1.6	1.2	Ind
	East of Pennsylvania	64.6	65.2	67.6	3.0	2.4	67.6	3.0	2.3	Ind
	West of Third	63.4	64.4	67.1	3.7	2.7	67.1	3.7	2.7	Ind
	East of Third	58.2	60.4	63.5	**5.2**	3.1	63.5	**5.2**	3.1	Ind
Arkansas Street	North of 18th	54.9	56.1	56.1	1.2	0.0	56.1	1.2	0.0	Res/Ind
	South of 18th	54.2	55.5	55.5	1.3	0.0	55.5	1.3	0.0	Res
Future Driveway	East of Illinois	NA	NA	65.2	NA	NA	65.2	NA	NA	Ind
Illinois Street	North of Mariposa	56.8	60.4	62.0	**5.3**	1.6	62.1	**5.3**	1.6	Vacant/UCSF
	Mariposa-19th	59.9	60.4	63.7	**3.8**	**3.3**	63.7	**3.8**	**3.3**	**Res**/Com/Ind
	19th to 20th	60.4	60.6	64.6	**4.1**	**4.0**	64.5	**4.1**	**4.0**	**Res**/Com/Ind
	20th to Driveway	58.9	59.5	64.8	**5.9**	**5.3**	64.6	**5.7**	**5.1**	Ind
	Driveway to 22nd	58.9	60.9	66.4	**7.5**	**5.5**	66.3	**7.4**	**5.3**	Ind
	South of 22nd	57.6	59.6	63.9	**6.3**	4.3	64.0	**6.5**	4.4	Ind
Indiana Street	North of 22nd	54.1	55.3	55.3	1.1	0.0	55.3	1.1	0.0	Com/Ind
	South of 22nd	54.6	55.2	55.2	0.6	0.0	55.2	0.6	0.0	Ind
	North of 25th	58.6	61.5	62.5	**3.8**	0.9	62.6	**4.0**	1.1	Ind/**Res**

Table 4.F.13 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
	South of 25th	57.5	60.0	60.0	2.6	0.0	60.0	2.6	0.0	Ind/Res
Mariposa Street	West of I-280 Ramp	63.8	64.3	64.3	0.5	0.1	64.3	0.5	0.1	Ind/Res
	East of I-280 Ramp	65.6	67.2	67.5	1.9	0.2	67.5	2.0	0.3	Ind
	East of Indiana	63.4	65.5	66.0	2.6	0.4	66.0	2.6	0.4	Ind
	West of Third	62.5	64.8	65.3	2.8	0.5	65.3	2.8	0.5	Ind/Res
	East of Third	60.3	63.1	63.8	3.5	0.7	63.8	3.4	0.7	Ind
	West of Illinois	60.2	63.1	63.8	3.6	0.7	63.8	3.6	0.7	Ind
	East of Illinois	59.6	61.5	61.5	1.9	0.0	61.5	1.9	0.0	Ind
Tennessee Street	North of 22nd	53.4	56.0	56.0	2.7	0.0	56.0	2.7	0.0	Com/Res
	South of 22nd	49.7	49.9	49.9	0.2	0.0	49.9	0.2	0.0	Res/Com
Texas Street	North of 18th	52.6	53.1	53.1	0.5	0.0	53.1	0.5	0.0	Res
	South of 18th	51.5	52.9	52.9	1.4	0.0	52.9	1.4	0.0	Res

Notes: Noise levels may vary by up to one-tenth of a decibel due to rounding. Noise levels in **bold** exceed either of the following threshold increases when compared to baseline noise levels: (1) an increase of 5 dBA or more, or (2) an increase of 3 dBA or more in areas where the existing or resulting noise increase exceeds acceptable (or satisfactory) levels for the affected use (see Figure 4.F.3: San Francisco Land Use Compatibility Chart for Community Noise, p. 4.F.23).

Res: Residential; Com: Commercial; Off: Office; Ind: Industrial; Inst: Institutional; UCSF: University of California, San Francisco Traffic noise modeling was completed using the Federal Highway Administration RD-77-108 model. Assumptions include: Travel speeds on all streets, 25 mph, except on 16th, Third, and Cesar Chavez, where the posted speed limit is 30 mph; Vehicle Mix: 98% Autos/1.5% Medium Trucks/0.5% Heavy Trucks; Day-Night Split: 76% Day (7:00 a.m. to 7:00 p.m.), 12% Evening (7:00 p.m. to 10:00 p.m.), and 12% Night (10:00 p.m. to 7:00 a.m.). Background noise levels due to traffic on other roadways (such as cross-streets or nearby freeways) and non-traffic-related activities are not reflected in these noise levels. Noise levels in this table are intended to indicate incremental noise changes due to Proposed Project implementation and future growth. Since they do not include background noise levels, they may not necessarily reflect actual noise levels along these roadway segments if there are other nearby sources of noise. Changes between scenarios analyzed may not show change due to rounding in the noise modeling.

Source: Orion Environmental Associates, 2016

These street segments either directly adjoin the project site or are within two blocks of the project site and provide direct access to the site. It is noted that existing land uses located adjacent to all but one of the above-listed street segments are commercial or industrial, and such uses are not considered sensitive to traffic noise increases (i.e., not noise-sensitive receptors). Residential development is located adjacent to the segment of Illinois Street between Mariposa Street and 20th Street. Based on the significance thresholds for traffic noise increases, these cumulative traffic noise increases would be a cumulatively significant impact because traffic noise would result in a substantial permanent increase in ambient noise levels, and the project's contribution to these cumulative increases would be cumulatively considerable.

Additionally, when 2040 cumulative (with Proposed Project) noise levels are compared to 2020 baseline noise levels, 2020 noise levels would increase by 0 to 15 dBA under both scenarios with increases exceeding the significance thresholds for traffic noise increases on the following roadway segments:

- Third Street (Channel to south of Mission Rock and 20th to 23rd Streets)
- 20th Street (east of Third Street to east of Illinois Street)
- 22nd Street (west of Third Street to east of Illinois Street)
- 23rd Street (Third Street to Illinois Street)
- 25th Street (west of Third Street to Illinois Street)
- Cesar Chavez (East of Third Street)
- Illinois Street (Mariposa Street to south of 22nd Street)
- Indiana Street (north of 25th Street)

These street segments either directly adjoin the project site or are within approximately eight blocks of the project site and several provide direct access to the site. It is noted that existing land uses located adjacent to many of the above-listed street segments are commercial or industrial, and such uses are not considered sensitive to traffic noise increases (i.e., not noise-sensitive receptors). There is a school and residential development located adjacent to 20th Street between Third Street and Illinois Street. Residential development is also located adjacent to Third Street (Channel to 25th), Illinois Street (Mariposa Street to 20th Street), and on 22nd Street (west of Third Street). Based on the significance thresholds for traffic noise increases, these cumulative traffic noise increases would also be a cumulatively significant impact because traffic noise would result in a substantial permanent increase in baseline noise levels. The project's contribution to these increases would range from 22 to 95 percent of these increases and therefore, the Proposed Project contribution to these cumulative traffic noise increases would be cumulatively considerable.

Implementation of Transportation Demand Management measures required in Air Quality Mitigation Measure M-AQ-1f: Transportation Demand Management, could result in reductions of one-way traffic by up to 20 percent, and such reductions could provide noise level reductions of up to 1.0 dB. Such reductions would reduce the above significant noise increases to less than significant along Illinois Street (between Mariposa Street and the proposed 23rd Street) and 22nd Street (west of Third Street) but would not be sufficient to reduce cumulative noise increases on any of the other above-listed street segments to less-than-significant levels (i.e., below threshold levels). Cumulative traffic noise increases would still exceed the significance thresholds for traffic noise increases on some of the above-listed street segments by up to 2.0 dBA when compared to future baseline noise levels (2040) and by up to 14.2 dBA when compared to existing baseline noise levels (2020). Therefore, the proposed project would result in a considerable contribution to this cumulative impact, which is significant and unavoidable with mitigation.

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G. AIR QUALITY

INTRODUCTION

This section discusses the existing air quality conditions in the project area, presents the regulatory framework for air quality management, and analyzes the potential for the Proposed Project to affect existing air quality conditions, both regionally and locally, from activities that emit criteria and non-criteria air pollutants. It also analyzes the types and quantities of emissions that would be generated on a temporary basis from proposed construction activities as well as those generated over the long term from operation of the Proposed Project. The analysis determines whether those emissions are significant in relation to applicable air quality standards and identifies feasible mitigation measures for significant adverse impacts. This section also includes an assessment of the potential for odor impacts and an analysis of cumulative air quality impacts. Emissions of greenhouse gases (GHGs) resulting from the Proposed Project's potential impacts on climate change and the City's and State's goals for GHG emissions are presented and discussed in Section 4.H, Greenhouse Gas Emissions.

The analysis in this section is based on a review of existing air quality conditions in the Bay Area region and air quality regulations administered by the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD). This analysis includes methodologies identified in the updated BAAQMD *CEQA Air Quality Guidelines*[1] and its companion documentation. Additionally, an Air Quality Technical Report (AQTR)[2] was prepared for the Proposed Project; this report quantitatively assesses the air quality contributions of the Proposed Project and forms the basis of much of the assessment of air quality impacts herein.

ENVIRONMENTAL SETTING

CLIMATE AND METEOROLOGY

The project site is in the San Francisco Bay Area Air Basin (SFBAAB or air basin). The air basin's moderate climate steers storm tracks away from the region for much of the year, although storms generally affect the region from November through April. San Francisco's proximity to

[1] BAAQMD *CEQA Air Quality Guidelines*, Updated May 2012. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/baaqmd-ceqa-guidelines_final_may-2012.pdf?la=en. Accessed July 19, 2016.

[2] Environmental Science Associates, Pier 70 Mixed Use District Project Air Quality Technical Report, December 2016.

the onshore breezes stimulated by the Pacific Ocean provides for generally very good air quality in the City and at the project site.

Annual temperatures in the project area average in the mid-50s (degrees Fahrenheit), generally ranging from the low 40s on winter mornings to the mid-70s during summer afternoons. Daily and seasonal oscillations of temperature are small because of the moderating effects of nearby San Francisco Bay. In contrast to the steady temperature regime, rainfall is highly variable and confined almost exclusively to the "rainy" period from November through April. Precipitation may vary widely from year to year as a shift in the annual storm track of a few hundred miles can mean the difference between a very wet year and drought conditions.

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants regionally. The project area is within the Peninsula climatological subregion. Marine air traveling through the Golden Gate is a dominant weather factor affecting dispersal of air pollutants within the region. Wind measurements recorded on the San Francisco mainland indicate a prevailing wind direction from the west and an average annual wind speed of 10.3 miles per hour (mph).[3] Increased temperatures create the conditions in which ozone formation can increase.

AMBIENT AIR QUALITY – CRITERIA AIR POLLUTANTS

As required by the 1970 Federal Clean Air Act, the EPA initially identified six criteria air pollutants that are pervasive in urban environments and for which State and Federal health-based ambient air quality standards have been established. The EPA calls these pollutants "criteria air pollutants," because the agency has regulated them by developing specific public health-based and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are the six criteria air pollutants originally identified by the EPA. Since adoption of 1970 Act, subsets of PM have been identified for which permissible levels have been established. These include PM of 10 microns in diameter or less (PM_{10}) and PM of 2.5 microns in diameter or less ($PM_{2.5}$).

The BAAQMD is the regional agency with jurisdiction for regulating air quality within the nine-county SFBAAB. The region's air quality monitoring network provides information on ambient concentrations of criteria air pollutants at various locations in the San Francisco Bay Area. Table 4.G.1: Summary of San Francisco Air Quality Monitoring Data (2011-2015), presents a

[3] Western Regional Climate Center, Website query, Prevailing Wind Direction in California. Available online at http://www.wrcc.dri.edu/htmlfiles/westwinddir.html#CALIFORNIA. Accessed November 19, 2015.

Table 4.G.1: Summary of San Francisco Air Quality Monitoring Data (2011-2015)

Pollutant	Most Stringent Applicable Standard	Number of Days Standards Were Exceeded and Maximum Concentrations Measured[a]				
		2011	2012	2013	2014	2015
Ozone						
Maximum 1-Hour Concentration (ppm)	>0.09[b]	0.070	0.069	0.069	0.079	0.085
Days 1-Hour Standard Exceeded		0	0	0	0	0
Maximum 8-Hour Concentration (ppm)	>0.070[c]	0.054	0.048	0.059	0.069	0.067
Days 8-Hour Standard Exceeded		0	0	0	0	0
Carbon Monoxide (CO)						
Maximum 1-Hour Concentration (ppm)	>20[b]	1.8	2.0	1.8	1.6	1.8
Days 1-Hour Standard Exceeded		0	0	0	0	0
Maximum 8-Hour Concentration (ppm)	>9.0[b]	1.2	1.2	1.4	1.2	1.3
Days 8-Hour Standard Exceeded		0	0	0	0	0
Suspended Particulates (PM_{10})						
Maximum 24-Hour Concentration ($\mu g/m^3$)	>50 [b]	46	**51**	44	36	47
Days 24-Hour Standard Exceeded[d]		0	1	0	0	0
Suspended Particulates ($PM_{2.5}$)						
Maximum 24-Hour Concentration ($\mu g/m^3$)	>35 [c]	**48**	**36**	**49**	**33**	**35**
Days 24-Hour Standard Exceeded[d]		2	1	2	0	0
Annual Average ($\mu g/m^3$)	>12 [b, c]	9.5	8.2	10.1	7.7	9.6
Nitrogen Dioxide (NO_2)						
Maximum 1-Hour Concentration (ppm)	>0.100 [c]	0.09	**0.12**	0.07	0.08	0.07
Days 1-Hour Standard Exceeded		0	1	0	0	0

Notes:

Bold values are in excess of applicable standard.

ppm = parts per million.

$\mu g/m^3$ = micrograms per cubic meter.

a Number of days exceeded is for all days in a given year, except for PM. PM_{10} was monitored every 6 days prior to 2013 and has been monitored every 12 days effective January 2013.

b State standard, not to be exceeded.

c Federal standard, not to be exceeded.

d Based on a sampling schedule of 1 out of every 6 days or every 12 days, for a total of approximately 60 samples per year for 2011 and 2012, and 30 samples per year for 2013, 2014, and 2015.

Source: BAAQMD, Bay Area Air Pollution Summary, 2011 – 2015. Available online at http://www.baaqmd.gov/about-air-quality/air-quality-summaries. Accessed April 21, 2016.

5-year summary for 2011 to 2015 of the highest annual criteria air pollutant concentrations, recorded at the air quality monitoring station operated and maintained by the BAAQMD at 16th and Arkansas streets (Potrero Hill), approximately 1 mile northwest of the project site. Table 4.G.1 also compares measured pollutant concentrations with the most stringent applicable ambient air quality standards (State or Federal). These concentrations are health-based standards established with an ample margin of safety. For determining attainment with air quality standards, exceedances are assessed on a region-wide basis. Concentrations shown in bold indicate only a localized exceedance of the standard.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG, also sometimes referred to as volatile organic compounds or VOCs by some regulatory agencies) and oxides of nitrogen (NOx) in the presence of sunlight. The main sources of ROG and NOx, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases, such as asthma, bronchitis, and emphysema.

According to published data, and as shown in Table 4.G.1, p. 4.G.3, above, the most stringent applicable standards for ozone (State 1-hour standard of 0.09 parts per million [ppm] and the Federal 8-hour standard of 0.075 ppm) were not exceeded in San Francisco between 2011 and 2015. In 2015, the EPA strengthened the 8-hour ozone standard to 0.070 ppm, and the new standard became effective December 28, 2015.

Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal. As shown in Table 4.G.1, the more stringent State CO standards were not exceeded between 2011 and 2015. Measurements of CO indicate hourly maximums ranging between 8 and 10 percent of the more stringent State standard, and maximum 8-hour CO levels that are approximately 13 to 16 percent of the allowable 8-hour standard.

Particulate Matter

Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from human-made and natural sources. Particulate matter is measured in two size ranges: PM_{10} and $PM_{2.5}$. In the Bay Area, motor vehicles generate about one-half of the SFBAAB's particulates, through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the CARB, studies in the United States and elsewhere "have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks," and studies of children's health in California have demonstrated that particle pollution "may significantly reduce lung function growth in children."[4] The CARB also reports that statewide attainment of PM standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.[5] Among the criteria pollutants that are regulated, particulates appear to represent a serious ongoing health hazard. As long ago as 1999, the BAAQMD was reporting, in its *CEQA Air Quality Guidelines*, that studies had shown that elevated particulate levels contribute to the death of approximately 200 to 500 people per year in the Bay Area. $PM_{2.5}$ is of particular concern because epidemiologic studies have demonstrated that people who live near freeways, especially people who live within 500 feet of freeways or high-traffic roadways, have poorer health outcomes, including increased asthma symptoms and respiratory infections and decreased pulmonary function and lung development in children.[6]

As presented above in Table 4.G.1, the State 24-hour PM_{10} standard was exceeded on one monitored occasion between 2011 and 2015 in San Francisco. It is estimated that the State 24-hour PM_{10} standard of 50 micrograms per cubic meter ($\mu g/m^3$) was exceeded on up to 6 days per year between 2011 and 2015.[7] The State 24-hour $PM_{2.5}$ standard was exceeded on five monitored occasions between 2011 and 2015.[6] The Federal and State annual average standards were not exceeded between 2011 and 2015.

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[4] CARB, *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution*, November 2007, p.1.

[5] Ibid.

[6] San Francisco Department of Public Health, *Assessment and Mitigation of Air Pollutant Health Effect from Intra-urban Roadways: Guidance for Land Use Planning and Environmental Review*, May 2008, p. 7.

[7] PM_{10} was sampled every sixth day prior to 2013; therefore, actual days over the standard can be estimated to be six times the numbers listed in the table. $PM_{2.5}$ is continuously monitored.

Nitrogen Dioxide

NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component of the air on high pollution days, especially in conjunction with high ozone levels. The current State 1-hour standard for NO_2 (0.18 ppm) is being met in San Francisco. In 2010, the EPA implemented a new 1-hour NO_2 standard (0.10 ppm), which is presented in Table 4.G.2: State and Federal Ambient Air Quality Standards and Attainment Status for the San Francisco Bay Area Air Basin, below. Currently, the CARB is recommending that the SFBAAB be designated as an attainment area for the new standard.[8] As shown in Table 4.G.1, p. 4.G.3, this new Federal standard was exceeded on 1 day at the San Francisco station between 2011 and 2015.

The EPA has also established requirements for a new monitoring network to measure NO_2 concentrations near major roadways in urban areas with a population of 500,000 or more. Sixteen new near-roadway monitoring sites are required in California, three of which will be in the Bay Area. These monitors are planned for Berkeley, Oakland, and San Jose. The Oakland station commenced operation in February 2014, and the San Jose station commenced operation in March 2015; the Berkeley station is not yet operational. The new monitoring data may result in a need to change area designations in the future. The CARB will revise the area designation recommendations, as appropriate, once the new monitoring data become available.

Sulfur Dioxide

SO_2 is a colorless, acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease.[9] Pollutant trends suggest that the SFBAAB currently meets and will continue to meet the State standard for SO_2 for the foreseeable future.

In 2010, the EPA implemented a new 1-hour SO_2 standard, which is presented in Table 4.G.2. The EPA initially designated the SFBAAB as an attainment area for SO_2. Similar to the new Federal standard for NO_2, the EPA established requirements for a new monitoring network to

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[8] CARB, Recommended Area Designations for the 2010 Nitrogen Dioxide Standards, Technical Support Document, January 2011. Available online at http://www.airquality.org/plans/federal/no2/NO2Enclosure_1.pdf. Accessed January 19, 2016.

[9] BAAQMD, *CEQA Air Quality Guidelines*, May 2011. Available online at http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx; p. C-16. Accessed January 19, 2016.

measure SO_2 concentrations beginning in January 2013.[10] No additional SO_2 monitors are required for the Bay Area, because the BAAQMD jurisdiction has never been designated as non-attainment for SO_2 and no State implementation plans or maintenance plans have been prepared for SO_2.[11]

Lead

Leaded gasoline (phased out in the United States beginning in 1973), paint (on older houses, cars), smelters (metal refineries), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects, which put children at special risk. Some lead-containing chemicals cause cancer in animals. Lead levels in the air have decreased substantially since leaded gasoline was eliminated.

Ambient lead concentrations are only monitored on an as-warranted, site-specific basis in California. On October 15, 2008, the EPA strengthened the national ambient air quality standard for lead by lowering it from 1.50 $\mu g/m^3$ to 0.15 $\mu g/m^3$ on a rolling 3-month average. The EPA revised the monitoring requirements for lead in December 2010.[12] These requirements focus on airports and large urban areas resulting in an increase in 76 monitors nationally. Lead monitoring stations in the Bay Area are located at Palo Alto Airport, Reid-Hillview Airport (San Jose), and San Carlos Airport. Non-airport locations for lead monitoring are in Redwood City and San Jose.

Air Quality Index

The EPA developed the Air Quality Index (AQI) scale to make the public health impacts of air pollution concentrations easily understandable. The AQI, much like an air quality "thermometer," translates daily air pollution concentrations into a number on a scale between 0 and 500. The numbers in the scale are divided into six color-coded ranges, with numbers 0 through 300 as outlined below.

[10] U.S. EPA Fact Sheet: Revisions to the Primary National Ambient Air Quality Standard, Monitoring Network, and Data Reporting Requirements for Sulfur Dioxide, June 2, 2010. Available online at http://www3.epa.gov/airquality/sulfurdioxide/pdfs/20100602fs.pdf. Accessed January 19, 2016.

[11] BAAQMD, *2013 Air Monitoring Network Plan*, July 2014. Available online at http://www.baaqmd.gov/~/media/Files/Technical%20Services/2013_Network_Plan.ashx?la=en; p. 27. Accessed January 19, 2016.

[12] U.S. EPA *Fact Sheet Revisions to Lead Ambient Air Quality Monitoring Requirements*. Available online at http://www3.epa.gov/airquality/lead/pdfs/Leadmonitoring_FS.pdf. Accessed January 19, 2016.

Table 4.G.2: State and Federal Ambient Air Quality Standards and Attainment Status for the San Francisco Bay Area Air Basin

Pollutant	Averaging Time	State (SAAQS[a])		Federal (NAAQS[b])	
		Standard	Attainment Status	Standard	Attainment Status
Ozone	1-hour	0.09 ppm	**N**	NA	See Note c
	8-hour	0.070 ppm	**N**	0.070 ppm[d]	**N**/Marginal
Carbon Monoxide (CO)	1-hour	20 ppm	A	35 ppm	A
	8-hour	9 ppm	A	9 ppm	A
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm	A	0.100 ppm	U
	Annual	0.030 ppm	NA	0.053 ppm	A
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm	A	0.075 ppm	A
	24-hour	0.04 ppm	A	0.14 ppm	A
	Annual	NA	NA	0.03 ppm	A
Particulate Matter (PM_{10})	24-hour	50 µg/m^3	**N**	150 µg/m^3	U
	Annual[e]	20 µg/m^3 [f]	**N**	NA	NA
Fine Particulate Matter ($PM_{2.5}$)	24-hour	NA	NA	35 µg/m^3	**N**
	Annual	12 µg/m^3	**N**	12 µg/m^3	U/A
Sulfates	24-hour	25 µg/m^3	A	NA	NA
Lead	30-day	1.5 µg/m^3	A	NA	NA
	Cal. Quarter	NA	NA	1.5 µg/m^3	A
	Rolling 3-month average	NA	NA	0.15	U
Hydrogen Sulfide	1-hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	8-hour	See Note g	U	NA	NA

Notes:

A = Attainment; **N** = Non-attainment; U = Unclassified; NA = Not Applicable, no applicable standard; ppm = parts per million; µg/m^3 = micrograms per cubic meter.

a SAAQS = state ambient air quality standards (California). SAAQS for ozone, CO (except Lake Tahoe), SO_2 (1-hour and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.

b NAAQS = national ambient air quality standards. NAAQS, other than ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentration is 0.08 ppm or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of the 98th percentile is less than the standard.

c The U.S. Environmental Protection Agency (EPA) revoked the national 1-hour ozone standard on June 15, 2005.

d This Federal 8-hour ozone standard was approved by EPA in October 2015 and became effective on December 28, 2015.

e State standard = annual geometric mean; national standard = annual arithmetic mean.

f In June 2002, the CARB established new annual standards for $PM_{2.5}$ and PM_{10}.

g Statewide visibility-reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Sources: BAAQMD, Standards and Attainment Status, 2015. Available online at http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed January 19, 2016.

U.S. EPA National Ambient Air Quality Standards, 2012. Available online at http://www3.epa.gov/ttn/naaqs/criteria.html. Accessed January 19, 2016.

- Green (0-50) indicates "good" air quality. No health impacts are expected when air quality is in the green range.
- Yellow (51-100) indicates air quality is "moderate." Unusually sensitive people should consider limited prolonged outdoor exertion.
- Orange (101-150) indicates air quality is "unhealthy for sensitive groups." Active children and adults, and people with respiratory disease, such as asthma, should limit outdoor exertion.
- Red (151-200) indicates air quality is "unhealthy." Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
- Purple (201-300) indicates air quality is "very unhealthy." Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit outdoor exertion.

The AQI numbers refer to specific amounts of pollution in the air. They are based on the Federal air quality standards for ozone, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. In most cases, the Federal standard for these air pollutants corresponds to the number 100 on the AQI chart. If the concentration of any of these pollutants rises above its respective standard, the air quality can be unhealthy for the public. In determining the air quality forecast, local air districts, including the BAAQMD, use the anticipated concentration measurements for each of the major pollutants, convert them into AQI numbers, and determine the highest AQI for each zone in a district.

Readings below 100 on the AQI scale would not typically affect the health of the general public (although readings in the moderate range of 50 to 100 may affect unusually sensitive people). Levels above 300 rarely occur in the United States, and readings above 200 have not occurred in the Bay Area in decades.[13] AQI statistics over recent years indicate that air quality in the Bay Area is predominantly in the "Good" or Moderate" categories and healthy on most days for most people. Historical BAAQMD data indicate that the SFBAAB experienced air quality in the Red level (unhealthy) on 3 days between the years 2010 and 2014. As shown in Table 4.G.3: Air Quality Index Statistics for the San Francisco Bay Area Air Basin, the SFBAAB had a total of 14 Orange-level (unhealthy for sensitive groups) days in 2010, 12 days in 2011, 8 days in 2012, 15 days in 2013, and 11 days in 2014.

[13] BAAQMD, 2014. Available online at sparetheair.org/Stay-Informed/Todays-Air-Quality/Air-Quality-Index.aspx. Accessed January 19, 2016.

Table 4.G.3: Air Quality Index Statistics for the San Francisco Bay Area Air Basin

AQI Statistics for San Francisco Bay Area Air Basin	Number of Days by Year				
	2010	2011	2012	2013	2014
Unhealthy for Sensitive Groups (Orange)	14	12	8	15	11
Unhealthy (Red)	1	0	0	1	1

Source: BAAQMD, 2016

TOXIC AIR CONTAMINANTS AND LOCAL HEALTH RISKS AND HAZARDS

In addition to criteria air pollutants, individual projects may emit toxic air contaminants (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long duration) and acute (i.e., severe but short-term) adverse effects to human health, including carcinogenic effects. Human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

Unlike criteria air pollutants, TACs are not subject to ambient air quality standards but are regulated by the BAAQMD using a risk-based approach to determine which sources and pollutants to control as well as the degree of control. A health risk assessment (HRA) is an analysis which estimates human health exposure to toxic substances, and when considered together with information regarding the toxic potency of the substances, provides quantitative estimates of health risks.[14]

Exposures to fine PM ($PM_{2.5}$) are strongly associated with mortality, respiratory diseases, and lung development in children, and other end results, such as hospitalization for cardiopulmonary disease.[15] In addition to $PM_{2.5}$, diesel PM (DPM), a byproduct of diesel fuel combustion, is also of concern. The CARB identified DPM as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans.[16] The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

[14] In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. The applicant is then subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, estimating the increased risk of cancer as a result of exposure to one or more TACs.

[15] SFDPH, *Assessment and Mitigation of Air Pollutant Health Effects from Intra-Urban Roadways: Guidance for Land Use Planning and Environmental Review*, May 2008.

[16] CARB, Fact Sheet, "The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines," October 1998.

San Francisco Modeling of Air Pollution Exposure Zones

In an effort to identify areas of San Francisco most adversely affected by sources of TACs, San Francisco partnered with the BAAQMD to inventory and assess air pollution and exposures from vehicles, stationary sources, and area sources within San Francisco. Citywide dispersion modeling was conducted using AERMOD[17] to assess the emissions from the following primary sources: vehicles on local roadways, permitted stationary sources, port and maritime sources, and Caltrain. Emissions of PM_{10} (DPM is assumed equivalent to PM_{10}), $PM_{2.5}$, and total organic gases (TOG) were modeled on a 20 × 20–meter receptor grid covering the entire City. The citywide modeling results represent a comprehensive assessment of existing cumulative exposures to air pollution throughout the City. The methodology and technical documentation for modeling citywide air pollution is available in the document entitled, *The San Francisco Community Risk Reduction Plan: Technical Support Documentation*.[18]

Model results were used to identify areas in the City with poor air quality, termed Air Pollutant Exposure Zones (APEZ), based on the following health-protective criteria: (1) cumulative $PM_{2.5}$ concentrations greater than 10 $\mu g/m^3$; and/or (2) excess cancer risk from the contribution of emissions from all modeled sources greater than 100 per one million persons exposed.

An additional health vulnerability layer was incorporated in the APEZ for those San Francisco ZIP codes in the worst quintile of Bay Area Health Vulnerability scores (ZIP Codes 94102, 94103, 94105, 94124, and 94130). In these areas, the standard for identifying areas as being within the zone were lowered to: (1) excess cancer risk from the contribution of emissions from all modeled sources greater than 90 per one million persons exposed; and/or (2) cumulative $PM_{2.5}$ concentrations greater than 9 $\mu g/m^3$.

Lastly, all parcels within 500 feet of a major freeway were also included in the APEZ, consistent with findings in CARB's *Air Quality and Land Use Handbook: A Community Health Perspective*, which suggests air pollutant levels decrease substantially at approximately 500 feet from a freeway.[19]

Citywide modeling results identified the project site as within an APEZ. However, this designation reflects an incorrect assumption that BAE Systems (a permitted stationary source

[17] AERMOD is the EPA's preferred or recommended steady state air dispersion plume model. For more information on AERMOD and to download the AERMOD Implementation Guide see www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod (accessed November 20, 2015).

[18] BAAQMD, San Francisco Department of Public Health, and San Francisco Planning Department, *The San Francisco Community Risk Reduction Plan: Technical Support Documentation*, December 2012.

[19] CARB, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005. Available online at http://www.arb.ca.gov/ch/handbook.pdf. Accessed November 20, 2015.

operator) is within the project site, rather than north of the project site where it is currently located. Revised modeling was conducted in consultation with BAAQMD to reassess cancer risk and $PM_{2.5}$ concentrations within the project area and its environs. This updated modeling demonstrated that the Proposed Project site is not located in an areas that meet the APEZ criteria.

Fine Particulate Matter

In April 2011, the EPA published *Policy Assessment for the Particulate Matter Review of the National Ambient Air Quality Standards*. In this document, EPA staff concludes that the then-current Federal annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ should be revised to a level within the range of 13 to 11 $\mu g/m^3$, with evidence strongly supporting a standard within the range of 12 to 11 $\mu g/m^3$. APEZs for San Francisco are based on the health protective $PM_{2.5}$ standard of 11 $\mu g/m^3$, as supported by the EPA's Particulate Matter Policy Assessment, although lowered to 10 $\mu g/m^3$ to account for uncertainty in accurately predicting air pollutant concentrations using emissions modeling programs.

Excess Cancer Risk

The 100 per one million persons exposed (100 excess cancer risk) criterion discussed above in the "San Francisco Modeling of Air Pollution Exposure Zones" section, pp. 4.G.11-4.G.12, is based on EPA guidance for conducting air toxic analyses and making risk management decisions at the facility and community-scale level.[20] As described by the BAAQMD, the EPA considers a cancer risk of 100 per one million or less to be within the "acceptable" range of cancer risk. Furthermore, in the 1989 preamble to the benzene National Emissions Standards for Hazardous Air Pollutants (NESHAP) rulemaking,[21] the EPA states that it "…strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately one in one million and (2) limiting to no higher than approximately one in ten thousand [100 in one million] the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years." The 100 per one million excess cancer cases is also consistent with the ambient cancer risk in the most pristine portions of the Bay Area based on BAAQMD regional modeling.[22]

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[20] BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, p. 67. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/revised-draft-ceqa-thresholds-justification-report-oct-2009.pdf?la=en. Accessed February 6, 2016.

[21] 54 *Federal Register* 38044, September 14, 1989.

[22] BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, p. 67.

In addition to monitoring criteria pollutants, both the BAAQMD and CARB operate TAC monitoring networks in the SFBAAB. These stations measure 10 to 15 TACs, depending on the specific station. The TACs selected for monitoring are those that traditionally have been found in the highest concentrations in ambient air and therefore tend to produce the most significant risk. The nearest BAAQMD ambient TAC monitoring station to the project area is the station at 10 Arkansas Street in San Francisco. The ambient concentrations of carcinogenic TACs measured at the Arkansas Street station, approximately 0.5 mile west of the project site, are presented in Table 4.G.4: 2015 Annual Average Ambient Concentrations of Carcinogenic Toxic Air Contaminants Measured at BAAQMD Monitoring Station, 10 Arkansas Street, San Francisco. The estimated cancer risk from a lifetime exposure (70 years) to these substances is also reported in the table. When TAC measurements at this station are compared to ambient concentrations of various TACs for the Bay Area as a whole, the cancer risks associated with mean TAC concentrations in San Francisco are similar to those for the Bay Area as a whole. Therefore, the estimated average lifetime cancer risk resulting from exposure to TAC concentrations monitored at the San Francisco station do not appear to be any greater than for the Bay Area as a region.

Roadway-Related Pollutants

Motor vehicles are responsible for a large share of air pollution, especially in California. Vehicle tailpipe emissions contain diverse forms of particles and gases, and vehicles also contribute to particulates by generating road dust through tire wear. Epidemiologic studies have demonstrated that people living close to freeways or busy roadways have poorer health outcomes, including increased asthma symptoms and respiratory infections, and decreased pulmonary function and lung development in children. Air pollution monitoring conducted in conjunction with epidemiologic studies has confirmed that roadway-related health effects vary with modeled exposure to PM and NO_2. In traffic-related studies, the additional non-cancer health risk attributable to roadway proximity was seen within 1,000 feet of the roadway and was strongest within 300 feet.[23] As a result, the CARB recommends that new sensitive land uses not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day.

Diesel Particulate Matter

The CARB identified DPM as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near

[23] CARB, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005. Available online at http://www.arb.ca.gov/ch/handbook.pdf. Accessed October 22, 2015.

Table 4.G.4: 2015 Annual Average Ambient Concentrations of Carcinogenic Toxic Air Contaminants Measured at BAAQMD Monitoring Station, 10 Arkansas Street, San Francisco

Substance	Concentration	Cancer Risk per Million[a]
Gaseous TACs (ppb)		
Acetaldehyde	0.50[b]	2[b]
Benzene	0.20	18
1,3-Butadiene	0.038	14
Carbon Tetrachloride	0.094	25
Formaldehyde	1.28[b]	9[b]
Perchloroethylene	0.015	0.6
Methylene Chloride	0.127	0.4
Chloroform	0.030	0.8
Trichloroethylene	0.012	0.1
Particulate TACs (ng/m^3)		
Chromium (Hexavalent)	0.078	12
Total Risk for All TACs		**81.9**

Notes:

TACs = toxic air contaminants; BAAQMD = Bay Area Air Quality Management District; ppb = part per billion; ng/m^3 = nanograms per cubic meter.

[a] Cancer risks were estimated by applying published unit risk values to the measured concentrations.

[b] Year 2014 data, as 2015 data not available for these TACs.

Source: CARB, Ambient Air Toxics Summary-2013. Available online at: http://www.arb.ca.gov/adam/toxics/sitesubstance.html. Accessed October 22, 2015.

heavily traveled highways. The CARB estimated that the average Bay Area cancer risk from exposure to DPM, based on a population-weighted average ambient DPM concentration, is approximately 480 in one million, as of 2000, which is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. The statewide risk from DPM as determined by the CARB declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, CARB estimated the average statewide cancer risk from DPM at 540 in one million.[24,25]

[24] CARB, *California Almanac of Emissions and Air Quality - 2009 Edition*, Table 5-44 and Figure 5-12. Available online at http://www.arb.ca.gov/aqd/almanac/almanac09/chap509.htm. Accessed October 22, 2015.

In 2000, the CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. Subsequent CARB regulations apply to new trucks and diesel fuel. With new controls and fuel requirements, 60 trucks built in 2007 would have the same particulate exhaust emissions as one truck built in 1988.[26] The regulation is anticipated to result in an 80 percent decrease in statewide diesel health risk in 2020 as compared with the diesel risk in 2000. Despite notable emission reductions, the CARB recommends that proximity to sources of DPM emissions be considered in the siting of new sensitive land uses. The CARB notes that these recommendations are advisory and should not be interpreted as defined "buffer zones," and that local agencies must balance other considerations, including transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. With careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, the CARB's position is that infill development, mixed use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.[27]

SENSITIVE RECEPTORS

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. Population subgroups sensitive to the health effects of air pollutants include the elderly and the young; population subgroups with higher rates of respiratory disease, such as asthma and chronic obstructive pulmonary disease; and populations with other environmental or occupational health exposures (e.g., indoor air quality) that affect cardiovascular or respiratory diseases. The BAAQMD defines sensitive receptors as children, adults, and seniors occupying or residing in residential dwellings, schools, day care centers, hospitals, and senior-care facilities. Workers are not considered sensitive receptors because all employers must follow regulations set forth by the Occupation Safety and Health Administration (OSHA) to ensure the health and well-being of their employees.[28]

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[25] This calculated cancer risk value from ambient air exposure in the Bay Area can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which for men is more than 40 percent (based on a sampling of 17 regions nationwide), or greater than 400,000 in one million, according to the American Cancer Society. (American Cancer Society, last revised October. 1, 2014, available online at http://www.cancer.org/cancer/cancerbasics/lifetime-probability-of-developing-or-dying-from-cancer.)

[26] Pollution Engineering, *New Clean Diesel Fuel Rules Start*. July, 2006.

[27] CARB, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005. Available online at http://www.arb.ca.gov/ch/handbook.pdf. Accessed October 22, 2015.

[28] BAAQMD, *Recommended Methods for Screening and Modeling Local Risks and Hazards*, May 2011, p. 12.

The proximity of sensitive receptors to motor vehicles is an air pollution concern, especially in San Francisco where building setbacks are limited and roadway volumes are hig5her than most other parts of the Bay Area. Vehicles also contribute to particulates by generating road dust and through tire wear.

Existing receptors evaluated in this analysis include a representative sample of known residents (child and adult) in the surrounding neighborhood, and other sensitive receptors (school children, hospital/nursing home patients, etc.) located in the surrounding community and along the expected travel routes of the on-road delivery and haul trucks. For a list of sensitive receptors within 900 feet of the project site, refer to Table 4.F.4: Sensitive Receptors in the Project Vicinity, in Section 4.F, Noise, p. 4.F.15. The health risk impact analysis also includes receptor locations out to a distance of 1,000 meters from the project site, consistent with citywide modeling. In addition to the residential receptors, there are four schools and a daycare within 900 feet of the project site were identified: Dogpatch Alterntaive School (site 2), Potrero Kids Daycare, Dogpatch Alternative School (Site 1), La Picola Scuola Italiana, and Friends of Potrero Hill Nursery School.

The project site in not located within an area that meets the APEZ criteria. Background cancer risk values on the project site are between 21 and 44 in one million, with background values ranging from 0 to 265 in one million within 1,000 meters of the site.[29] Background $PM_{2.5}$ concentrations range from 8.3 to 8.8 $\mu g/m^3$ on the project site, with background values varying between 0 and 11 $\mu g/m^3$ within 1,000 meters of the site. The nearest off-site receptors within an APEZ are located approximately 900 feet to the west and are thus designated due to the proximity of Interstate 280.

EXISTING STATIONARY SOURCES OF AIR POLLUTION

The BAAQMD's inventory of permitted stationary sources of emissions shows eight permitted stationary emission facilities present within or near the 1,000-foot zone of influence[30] of the project site. The sources at these permitted facilities include printers, stationary diesel engines for power generators, a gas station, and the now decommissioned Potrero Power Plant (which was removed from the City's baseline model as part of this analysis). The BAE Systems ship repair facility north of the project site operates diesel-fired electric generators to maintain power for ships while at dry dock and also conducts sandblasting activities. The diesel generators generate

[29] Environmental Science Associates, Pier 70 Mixed Use District Project Air Quality Technical Report, December 2016.

[30] For assessing community risks and hazards, an area of influence of 1,000-foot radius is recommended around the project property boundary. BAAQMD recommends that any proposed project that includes the siting of a new source or receptor assess associated impacts within 1,000 feet, taking into account both individual and nearby cumulative sources. As explained above, the HRA evaluated sources within a larger area of 1,000 meters.

DPM emissions. The sandblasting generates $PM_{2.5}$ emissions. As a consequence, citywide modeling indicates background $PM_{2.5}$ concentrations of up to 9.5 $\mu g/m^3$ in the project vicinity.

MAJOR ROADWAYS CONTRIBUTING TO AIR POLLUTION

Third Street, 16th Street, Mariposa Street, 25th Street, and Cesar Chavez Street are arterial roadways in the existing local roadway system within 1,000 meters of the project site that carry at least 10,000 vehicles in annual average daily traffic based on the City's SF CHAMP roadway model.[31] This traffic contributes to concentrations of $PM_{2.5}$, DPM, and other air contaminants emitted from motor vehicles near the street level. Both Interstate 280 and the Caltrain rail line are also located within 1,000 meters from the project site. Aside from the surrounding major roadways, the only other areas of mobile-source activity or otherwise "non-permitted" sources (e.g., railyards, trucking distribution facilities, and high-volume fueling stations) located within 1,000 meters of the project site would be SF MUNI Woods Division storage and maintenance yards located at 22nd and Indiana streets and the Islais Creek Motor Coach Maintenance and Operations Facility at Cesar Chavez and Illinois streets.

REGULATORY FRAMEWORK

FEDERAL REGULATIONS

The 1970 Clean Air Act (last amended in 1990) requires that regional planning and air pollution control agencies prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants are planned to be controlled in order to achieve all standards by the deadlines specified in the act. These ambient air quality standards are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an ample margin of safety) to which the public can be exposed without adverse health effects. They are designed in consideration of those segments of the public most susceptible to respiratory distress, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above ambient air quality standards without observing adverse health effects.

The current attainment status for the SFBAAB, with respect to Federal standards, is summarized above in Table 4.G.2, p. 4.G.9. In general, the SFBAAB experiences low concentrations of most pollutants when compared to Federal standards, except for ozone and PM (PM_{10} and $PM_{2.5}$), for which standards are exceeded periodically (see Table 4.G.1, p. 4.G.3).

[31] San Francisco Metropolitan Transportation Agency, Chained Activity Modeling Process version 4.3.0, Average Daily Traffic Volumes, provided to ESA, August 2, 2012.

STATE REGULATIONS

California Clean Air Act

Although the Federal Clean Air Act established national ambient air quality standards, individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when Federal standards were established, and because of the unique meteorological problems in California, there is considerable diversity between the State and national ambient air quality standards, as shown in Table 4.G.2, p. 4.G.8. California ambient standards are at least as protective as national ambient standards and are often more stringent.

In 1988, California passed the California Clean Air Act (California Health and Safety Code Sections 39600 et seq.), which, like its Federal counterpart, required the designation of areas as attainment or non-attainment, but based these designations on State ambient air quality standards rather than the Federal standards. As indicated in Table 4.G.2, the SFBAAB is designated as "non-attainment" for State ozone, PM_{10}, and $PM_{2.5}$ standards, and is designated as "attainment" for other pollutants.

Toxic Air Contaminants

In 2005, the CARB approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles. The regulations generally limit idling of commercial motor vehicles (including buses and trucks) within 100 feet of a school or residential area for more than 5 consecutive minutes or periods aggregating more than 5 minutes in any 1 hour. Buses or vehicles also must turn off their engines upon stopping at a school and must not turn their engines on more than 30 seconds before beginning to depart from a school. Also, State law Senate Bill 352 (SB 352) was adopted in 2003 and limits locating public schools within 500 feet of a freeway or busy traffic corridor (Section 17213 of the Education Code; Section 21151.8 of the Public Resources Code).

The Carl Moyer Memorial Air Quality Standards Attainment Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a grant program that reduces air pollution from vehicles and equipment by providing funds to replace or retrofit older equipment or engines with engines, equipment, and other sources of air pollution, such as ground support equipment at airports, that are cleaner than what the EPA would require. Money collected through the Carl Moyer Program complements California's regulatory program by providing incentives to affect early or extra emission reductions, especially from emission sources in environmental justice communities and areas disproportionately impacted by

air pollution. The Carl Moyer Program funds clean air projects involving a variety of vehicles and equipment, including the following.

- Repower: The replacement of an in-use engine with another, cleaner engine.
- Retrofit: An emission control system used exclusively with an in-use engine, vehicle, or piece of equipment.
- New purchases: Vehicles or equipment certified to optional, lower emission standards.
- Fleet modernization or equipment replacement: The replacement of an older vehicle or piece of equipment that still has a remaining useful life with a newer, cleaner vehicle or piece of equipment. The old vehicle/equipment is scrapped. Equipment may include on-road heavy-duty vehicles and off-road equipment replacement as well as emergency vehicles (fire apparatus) and lawn and garden equipment replacement.
- Vehicle retirement (or car scrap): Paying owners of older, more polluting vehicles that still have remaining useful life to voluntarily retire those vehicles earlier than they would have otherwise.

The Carl Moyer Program establishes a cost effectiveness standard that a proposed clean air project must meet to receive funding under the program. On March 27, 2015, the cost effectiveness limit was updated to $18,030 per weighted ton of ROG, NOx, and PM in resulting emissions reductions.[32] The program has established guidelines and criteria for the funding of emissions reduction projects. The BAAQMD administers the Carl Moyer Program within the SFBAAB.

REGIONAL AND LOCAL REGULATIONS AND PLANS

Bay Area Air Quality Management District

The BAAQMD is the regional agency with jurisdiction over the nine-county region located in the SFBAAB. The Association of Bay Area Governments, Metropolitan Transportation Commission, county transportation agencies, cities and counties, and various non-governmental organizations also participate in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs. BAAQMD is responsible for attaining and maintaining air quality in the region within Federal and State air quality standards. Specifically, BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the region and to develop and implement strategies to attain the applicable Federal and State standards.

[32] CARB. Memorandum Re: Carl Moyer Program: Review and Update of the Cost-Effectiveness Limit and Capital Recovery Factors for 2015. March 27, 2015. Available online at http://www.arb.ca.gov/msprog/mailouts/msc1509/msc1509.pdf. Accessed April 24, 2015.

BAAQMD does not have authority to regulate emissions from motor vehicles. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various stationary sources, and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants, but TAC emissions sources are also subject to these rules and are regulated through the BAAQMD's permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD monitors the generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of the Proposed Project would be subject to the BAAQMD Rules and Regulations. Both Federal and State ozone plans rely heavily on stationary source control measures set forth in BAAQMD's Rules and Regulations.

Per its Engineering Policy and Procedure Manual,[33] the BAAQMD requires implementation of best available control technology for toxics and would deny an authority to construct or a permit to operate for any new or modified source of TACs that exceeds a cancer risk of 10 in one million or a chronic or acute hazard index of 1.0. The permitting process under BAAQMD Regulation 2, Rule 5 requires a Health Risk Screening Analysis, the results of which are posted on the BAAQMD's website.

Bay Area Air Quality Planning Relative to State and Federal Standards

Federal Air Quality Plan

Air quality plans developed to meet Federal requirements are referred to as State Implementation Plans. The Federal and State Clean Air Acts require plans to be developed for areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM_{10} standard). The most recent Bay Area ozone plan prepared in response to Federal air quality planning requirements is the 2001 Ozone Attainment Plan.

California Air Quality Plan

The *Bay Area 2010 Clean Air Plan* (hereafter the Clean Air Plan) was adopted on September 15, 2010, by the BAAQMD, in cooperation with the Bay Area Metropolitan Transportation Commission, the Bay Conservation and Development Commission, and Association of Bay Area Governments. The Clean Air Plan defines a control strategy that the BAAQMD and its partners implement to "(1) reduce emissions and decrease ambient concentrations of harmful pollutants; (2) safeguard public health by reducing exposure to air pollutants that pose the greatest health

[33] BAAQMD, Engineering Policy and Procedure Manual, 2013. Available online at http://www.baaqmd.gov/~/media/files/engineering/policy_and_procedures/engineering-policy-and-procedure-manual.pdf?la=en. Accessed February 6, 2016.

risk, with an emphasis on protecting the communities most heavily impacted by air pollution; and (3) reduce greenhouse gas (GHG) emissions to protect the climate. The legal impetus for the CAP is to update the previous ozone plan, the Bay Area 2005 Ozone Strategy, to comply with State air quality planning requirements as codified in the California Health & Safety Code."[34]

The 2010 Clean Air Plan updates and replaces the *2005 Ozone Strategy* in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone; provide a control strategy to reduce ozone, PM, TACs, and GHGs in a single, integrated plan; review progress in improving air quality in recent years; and establish emission control measures to be adopted or implemented in the 2010–2012 time frame. The control strategy includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the Metropolitan Transportation Commission, local governments, transit agencies, and others. The Clean Air Plan also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the State 1-hour ozone standard.[35] The 2010 Clean Air Plan is currently in the process of being updated with a Final Draft expected to be circulated in mid to late December 2016 and will be considered for approval by the BAAQMD Board in Spring of 2017.

San Francisco General Plan Air Quality Element

The *San Francisco General Plan* (*General Plan*) includes the 1997 Air Quality Element.[36] The objectives specified by the City include the following.

Objective 1:	Adhere to State and Federal air quality standards and regional programs.
Objective 2:	Reduce mobile sources of air pollution through implementation of the Transportation Element of the General Plan.
Objective 3:	Decrease the air quality impacts of development by coordination of land use and transportation decisions.
Objective 4:	Improve air quality by increasing public awareness regarding the negative health effects of pollutants generated by stationary and mobile sources.
Objective 5:	Minimize particulate matter emissions from road and construction sites.

[34] BAAQMD, *Bay Area 2010 Clean Air Plan, Final Clean Air Plan Volume 1*, p. ES-1, Adopted September 15, 2010.

[35] BAAQMD, *2010 Clean Air Plan*. Available online at http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx. Accessed November 20, 2015.

[36] San Francisco Planning Department, Air Quality Element of the *San Francisco General Plan*, July 1997, updated in 2000.

Objective 6: Link the positive effects of energy conservation and waste management to emission reductions.

San Francisco Construction Dust Ordinance

The City has adopted San Francisco Health Code Article 22B and San Francisco Building Code Section 106.A.3.2.6, which collectively constitute the Construction Dust Control Ordinance. The ordinance requires that all site preparation work, demolition, or other construction activities within San Francisco that have the potential to create dust or to expose or disturb more than 10 cubic yards or 500 square feet of soil comply with specified dust control measures whether or not the activity requires a permit from the Department of Building Inspection (DBI). For projects over 0.5 acre, the Dust Control Ordinance requires that the project sponsor submit a dust control plan for approval by the San Francisco Department of Public Health prior to issuance of a building permit by DBI or Port of San Francisco.

Building permits will not be issued without written notification from the Director of Public Health that the applicant has a site-specific dust control plan, unless the Director waives the requirement. The Construction Dust Control Ordinance requires project sponsors and contractors responsible for construction activities to control construction dust on the site or implement other practices that result in equivalent dust control that are acceptable to the Director of Public Health.

Dust suppression activities may include watering of all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 mph. Reclaimed water must be used if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code.

The project site is over 35 acres in size, and therefore the project sponsor would be required to prepare a dust control plan.

San Francisco Health Code Provisions for Urban Infill Development (Article 38)

San Francisco adopted Article 38 of the San Francisco Health Code in 2008, with revisions that took effect in December 2014. The revised code requires that sensitive land use developments within the mapped Air Pollutant Exposure Zones (APEZ) incorporate Minimum Efficiency Reporting Value 13 (MERV-13)-equivalent ventilation systems to remove particulates from outdoor air. This regulation also applies to conversion of uses to a sensitive use (residential, senior care facilities, day care centers, etc.). Article 38 may be applicable to the eastern portion of the Proposed Project because it is currently identified as within an APEZ in the Article 38 map

prepared by the San Francisco Department of Public Health[37] and would include sensitive (residential) land uses. Under Article 38, updates to the mapping are conducted every 5 years and those portions of the project site identified on the current map at the time of permitting would be subject to the filtration requirements. This designation is primarily the result of emissions from the BAE Systems ship repair facility north of the project site, which operates diesel generators to maintain power for ships while at dry dock and also conducts sandblasting activities, the former of which generates DPM emissions and the latter of which generates $PM_{2.5}$ emissions. The location of emissions from the BAE Systems facility was updated as part of this project's air quality analysis and based on that modeling, the project site would no longer meet the criteria for being within the APEZ. See Impact AQ-3 below for more information.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

For the impacts analyzed in this section, the project would have a significant impact related to air quality if it were to:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors affecting a substantial number of people.

APPROACH TO ANALYSIS

In general, the Proposed Project would result in two types of potential air quality impacts. First, the project would result in air pollution through construction activity. Second, the project would generate air pollutants during project operations, due to increased vehicle travel and new stationary sources (i.e., up to 11 new emergency standby diesel generators). During the approximately 11-year construction phase, operation of earlier phases of the project would overlap with construction of later phases.

[37] San Francisco Department of Public Health, Air Pollution Exposure Zone Map, Inset 2. Available online at https://www.sfdph.org/dph/files/EHSdocs/AirQuality/AirPollutantExposureZoneMap.pdf. Accessed February 6, 2016.

Each of these types of direct impacts is in turn separated into impacts from criteria air pollutant emissions, which are generally regional in nature, and into impacts associated with exposure to TACs and $PM_{2.5}$, which is a localized health impact expressed in terms of exposure to $PM_{2.5}$ concentrations and the probability of contracting cancer per 100 in one million persons exposed to TAC concentrations. The assessment of criteria air pollutant impacts addresses the second and third bulleted significance thresholds identified above. The assessment of localized health risk and exposure to $PM_{2.5}$ concentrations addresses the fourth bulleted significance threshold identified above.

Air quality analysis conducted for this impact assessment uses the emission factors, models, and tools distributed by a variety of agencies including CARB, the California Air Pollution Officers Association, the California Office of Environmental Health Hazard Assessment (March 2015), and the EPA. Additionally, the analysis includes methodologies identified in the BAAQMD *CEQA Air Quality Guidelines* (May 2012).

In the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015,[38] the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing environmental conditions might impact a project's users or residents, except where the project would significantly exacerbate an existing environmental condition. Accordingly, the significance criteria above related to exposure of new sensitive receptors to substantial pollutant concentrations are valid only to the extent that the project significantly exacerbates the air quality conditions. An impact is considered significant if the project would significantly exacerbate existing or future air quality conditions.

PROJECT FEATURES

The Proposed Project would include amendments to the *General Plan* and Planning Code, adding a new Pier 70 Special Use District (SUD), which would establish land use controls for the project site and incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development* document.

Under the provisions of the proposed Pier 70 SUD, the Proposed Project would provide a flexible land use program. To cover a full range of potential land uses that could be developed under the Proposed Project, the EIR analyzes a maximum residential use scenario (Maximum Residential Scenario) and a maximum commercial use scenario (Maximum Commercial Scenario) for the project site, which bracket specific maximum ranges of uses that could be developed.

[38] *California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal.4th 369. Opinion Filed December 17, 2015.

Proposed land uses on each parcel in the project site under both scenarios are presented in Figure 2.7: Proposed Land Use Plan – Maximum Residential Scenario, and Figure 2.8: Proposed Land Use Plan – Maximum Commercial Scenario, in Chapter 2, Project Description, pp. 2.30 and 2.32, respectively. Figure 2.10: Proposed Height Limits Plan, p. 2.36, shows that 10 parcels could have up to 11 structures exceeding 70 feet in height. Because of building code requirements, buildings of this height may require emergency standby generators that are a source of air pollutant emissions.

Under both scenarios, two parcels (C1 and C2) on the project site that are designated for district-structured parking could be developed with a mixture of residential/commercial uses or only residential use, depending on future market demand. Specifically, Parcel C1 could be developed with residential, commercial, or parking uses, and Parcel C2 could be developed with residential or parking uses. Active public rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on the roof of both of these parcels under both scenarios as well if the parcels are built as district parking structures. As a conservative measure, the air quality analysis assumes that these parcels will be developed with residential/commercial uses instead of parking structures, because for transportation and air quality purposes parking structures are not considered to be vehicle trip generators. Additionally, construction of residential/commercial uses would generate more emissions than a parking structure due to more extensive interior finishing and use of natural gas for heating purposes.

AIR QUALITY PLAN

The applicable air quality plan is the BAAQMD's 2010 Clean Air Plan. Consistency with the Clean Air Plan can be determined if the project supports the goals of the plan, includes applicable control measures from the plan, and if the project would not disrupt or hinder implementation of any control measures from the plan. Consistency with the Clean Air Plan is the basis for determining whether the Proposed Project would conflict with or obstruct implementation of an applicable air quality plan, the first bulleted significance criterion identified above.

CRITERIA AIR POLLUTANTS

As described above under Regulatory Framework, the SFBAAB experiences low concentrations of most pollutants when compared to Federal or State standards and is designated as either in attainment or unclassified for most criteria pollutants, with the exception of ozone, $PM_{2.5}$, and PM_{10}, for which these pollutants are designated as non-attainment for either the State or Federal standards.

By definition, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in non-attainment of air quality standards. Instead, a project's

individual emissions are considered to contribute to the existing, cumulative air quality conditions. If a project's contribution to cumulative air quality conditions is considerable, then the project's impact on air quality would be considered significant.[39]

Table 4.G.5: Criteria Air Pollutant Thresholds, identifies quantitative criteria air pollutant significance thresholds followed by a discussion of each threshold. Projects that would result in criteria pollutant emissions below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the SFBAAB. Both of these threholds (average daily and maximum annual) apply to operational emissions from a given project. Construction emissions are assessed solely with respect to the average daily threholds, pursuant to BAAQMD guidance, because of the temporary nature of construction-related emissions.[40]

Table 4.G.5: Criteria Air Pollutant Thresholds

Pollutant	Average Daily Emissions (pounds per day)	Maximum Annual Emissions (tons per year)
ROG	54	10
NOx	54	10
PM_{10}	82	15
$PM_{2.5}$	54	10
Fugitive Dust	Construction dust ordinance or other best management practices to control fugitive dust emissions	

Source: BAAQMD, CEQA Air Quality Guidelines, June 2011, p. 2-2. Available online at http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en. Accessed February 6, 2016.

The thresholds of significance for criteria air pollutants are based on substantial evidence presented in Appendix D of the 2011 BAAQMD CEQA Air Quality Guidelines and BAAQMD's 2009 *Revised Draft Options and Justification Report* concerning CEQA thresholds.[41]

The potential for a project to result in a cumulatively considerable net increase in criteria air pollutants that may contribute to an existing or projected air quality violation is based on the State and Federal Clean Air Acts' emissions limits for stationary sources. To ensure that new

[39] BAAQMD, *CEQA Air Quality Guidelines*, p. 2-1, May 2011. Available online at http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en. Accessed February 6, 2016.

[40] Ibid.

[41] BAAQMD, CEQA Air Quality Guidelines, May 2011, p. 2-2; BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, p. 17, October 2009.

stationary sources do not cause or contribute to a violation of an air quality standard, BAAQMD Regulation 2, Rule 2 requires that any new source that emits criteria air pollutants above a specified emissions limit must offset those emissions. For ozone precursors ROG and NOx, the offset emissions level is an annual average of 10 tons per year (or 54 pounds per day).[42] These levels represent emissions below which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants that could result in increased health effects.

The Federal New Source Review program was created under the Federal Clean Air Act to ensure that stationary sources of air pollution are constructed in a manner that is consistent with attainment of Federal health-based ambient air quality standards. For PM_{10} and $PM_{2.5}$, the emissions limit under the New Source Review program is 15 tons per year (82 pounds per day) and 10 tons per year (54 pounds per day), respectively. These emissions limits represent levels at which a source is not expected to have a significant impact on air quality.[43]

Although the regulations specified above apply to new or modified stationary sources, land use development projects generate ROG, NOx, PM_{10}, and $PM_{2.5}$ emissions as a result of increases in vehicle trips, energy use, architectural coating, and construction activities. Therefore, the identified thresholds can be applied to the construction and operational phases of land use projects. Those projects that would result in emissions below these thresholds would not be considered to contribute to an existing or projected air quality violation or result in a considerable net increase in ozone precursors or PM.

Fugitive dust emissions are typically generated during construction phases. Studies have shown that the application of best management practices (BMPs) at construction sites significantly controls fugitive dust,[44] and individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent.[45] The BAAQMD has identified eight BMPs to control fugitive dust emissions from construction activities.[46] San Francisco's Construction Dust Control Ordinance requires a number of fugitive dust control measures to ensure that construction projects do not result in visible dust. The project would be subject to the requirements of the

[42] BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, p. 17, October 2009.
[43] BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, p. 16, October 2009.
[44] Western Regional Air Partnership, *WRAP Fugitive Dust Handbook,* September 7, 2006. Available online at wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf. Accessed November 20, 2015.
[45] BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, p. 27.
[46] BAAQMD, *CEQA Air Quality Guidelines*, May 2011, p. 8-3.

Construction Dust Control Ordinance, which is the basis for determining the significance of air quality impacts from fugitive dust emissions.

Total construction emissions by phase were calculated using the latest version of CalEEMod (version 2013.2.2), and total emissions were divided by the number of construction days by phase to derive average daily emissions for comparison against applicable significance thresholds.

Construction emissions would be generated by many different construction sources, including off-road construction equipment such as excavators, loaders, backhoes, drill rigs, and cranes; and on-road trucks. The predominant source of emissions of NOx, PM_{10}, and $PM_{2.5}$ would be off-road equipment, which would generate more than three times the emissions of on-road vehicles and trucks.

Because operation of earlier phases would occur during construction of later phases, the construction analysis accounts for operational emissions that would occur simulataneously with construction of later phases. Therefore, operational emissions are evaluated after each of the five phases of construction and upon buildout of each scenario using the CalEEMod model. This allows for an analysis of the total emissions that would occur from construction activities and simultaneous operations during the 11-year construction period.

OTHER CRITERIA POLLUTANTS

Regional concentrations of CO in the Bay Area have not exceeded the State standards in the past 11 years, and SO_2 concentrations have never exceeded the standards. The primary source of CO emissions from development projects is vehicle traffic. Construction-related SO_2 emissions represent a negligible portion of the total basin-wide emissions, and construction-related CO emissions represent less than 5 percent of the Bay Area total basin-wide CO emissions. As discussed previously, the Bay Area is in attainment for both CO and SO_2. Furthermore, the BAAQMD has demonstrated, based on modeling, that to exceed the California ambient air quality standard of 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average) for CO, project traffic in addition to existing traffic would need to exceed 44,000 vehicles per hour at affected intersections (or 24,000 vehicles per hour where vertical and/or horizontal mixing is limited). The transportation analysis indicates that the intersection in the project area with the greatest vehicle volumes would be Fifth and Harrison streets with hourly volumes of 5,432 in year 2040 with the project and convention traffic, which is less than 24,000. Therefore, given the Bay Area's attainment status and the limited CO and SO_2 emissions that could result from the project, the project would not result in a cumulatively considerable net increase in CO or SO_2, and a quantitative analysis is not required.

LOCAL HEALTH RISKS AND HAZARDS

In addition to criteria air pollutants, individual projects may emit TACs. Analysis of toxic substances that may become airborne such as naturally occurring asbestos is assessed in Section 4.P, Hazards and Hazardous Materials.

As part of this project, Ramboll/ENVIRON conducted an HRA for the Proposed Project to provide quantitative estimates of health risks from exposures to TACs. The results have been included in an AQTR.[47] The HRA examined all sensitive receptors within 1,000 meters of the project boundary. The HRA effort updated the Citywide CRRP model to reflect refined locations of existing stationary sources as well as to update cancer risk values based on the latest (2015) guidance by the State OEHHA which will be considered for adoption by BAAQMD near the end of 2016[48]. The Proposed Project would locate new sensitive receptors (residential land uses) under both of the analyzed scenarios. The entirety of the project site was assessed as a potential sensitive receptor area using a 20-meter receptor grid. Refer to Figures 2.7 and 2.8, p. 2.30 and p. 2.32 of Chapter 2, Project Description. respectively, for specific locations of on-site residential uses under each of the scenarios analyzed. Exposure assessment guidance[49] establishes the assumption that people in residences would be exposed to air pollution 24 hours per day, 350 days per year, for 30 years as the basis for calculating cancer risk in all HRAs. Therefore, the assessment of air pollutant exposure to residents typically result in the greatest adverse health outcomes of all population groups.

As discussed previously, neither the proposed receptors nor the nearest off-site receptors are located within an area that currently meets the APEZ criteria. For receptors not located in areas that meet the APEZ criteria, an HRA is conducted to determine whether the Proposed Project would, in combination with other exiting sources in the area, result in a given off-site or on-site receptor meeting the APEZ criteria. If a receptor point meets the APEZ criteria, that otherwise would not without the project, a project would result in a significant health risk impact if the project would contribute to $PM_{2.5}$ concentrations above 0.3 $\mu g/m^3$ or result in an excess cancer risk greater than 10.0 per million persons exposed. The 0.3 $\mu g/m^3$ $PM_{2.5}$ concentration and the excess cancer risk of 10.0 per one million persons exposed are the levels below which the

[47] Environmental Science Associates, Pier 70 Mixed Use District Project Air Quality Technical Report, December 2016.

[48] Chong, Daphne, Toxicologist, Bay Area Air Quality Management District, phone conversation (with Chris Sanchez at Environmental Science Associates), October 12, 2016.

[49] California Environmental Protection Agency, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment*, February 2015. Available online at http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf. Accessed January 18, 2016.

BAAQMD considers new sources not to make a considerable contribution to cumulative health risks.[50]

CUMULATIVE IMPACTS

As discussed above, the contribution of a project's individual air emissions to regional air quality impacts is, by its nature, a cumulative effect. Emissions from past, present, and future projects in the vicinity also have or will contribute to adverse regional air quality impacts on a cumulative basis. No single project by itself would be sufficient in size to result in non-attainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative air quality conditions.[51] As described above, the project-level thresholds for criteria air pollutants are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants. Therefore, if a project's emissions are below the project-level thresholds, the project would not be considered to result in a considerable contribution to cumulative regional air quality impacts.

Similarly, the HRA takes into account the cumulative contribution of localized health risks to sensitive receptors from sources included in the Citywide modeling plus the Proposed Project's sources. Other future projects, whose emissions have not been incorporated into the existing citywide health risk modeling are also taken into consideration. However, unlike criteria air pollutants, health risks are localized impacts in that that beyond 1,000 feet from an emission source, pollutant levels tend to return to background levels. Thus, cumulative health risks are typically assessed based on cumulative emissions sources within 1,000 feet of a project site.

IMPACT EVALUATION

Impact AQ-1: During construction, the Proposed Project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants. ***(Significant and Unavoidable with Mitigation)***

Construction activities would result in emissions of ozone precursors and PM in the form of dust (fugitive dust) and exhaust (e.g., vehicle tailpipe emissions). Emissions of ozone precursors and PM are primarily a result of the combustion of fuel from on-road and off-road vehicles. However, ROGs are also emitted from activities that involve painting, other types of architectural

[50] BAAQMD, *California Environmental Quality Act Guidelines Update, Proposed Air Quality CEQA Thresholds of Significance*, May 3, 2010. vailable online at www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Proposed_Thresholds_Report_%20May_3_2010_Final.ashx?la=en. accessed October 21, 2015.

[51] BAAQMD, *CEQA Air Quality Guidelines*, May 2011, p. 2-1.

coatings, or asphalt paving. For both development scenarios, the Maximum Residential Scenario and the Maximum Commercial Scenario, Proposed Project construction is conceptual; however it is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve up to five phases, designated as Phases 1, 2, 3, 4, and 5; phasing estimates are shown in Table 2.5: Project Construction Phasing – Maximum Residential Scenario, in Chapter 2, Project Descripton, pp. 2.80-2.81, Figure 2.21: Proposed Phasing Plan – Maximum Residential Scenario, p. 2.60, Table 2.6: Project Construction Phasing – Maximum Commercial Scenario, pp. 2.83-2.84, and Figure 2.22: Proposed Phasing Plan – Maximum Commercial Scenario, p. 2.63.

Construction phases would include demolition, excavation, and site preparation; pile installation; placement of infrastructure; placement of foundations for structures; and fabrication of structures. Demolition and construction activities would require the use of drill rigs, heavy trucks, excavators, material loaders, cranes, and other mobile and stationary construction equipment. During the project's approximately 11-year construction period, construction activities would result in emissions of ozone precursors and PM, as discussed below.

Fugitive Dust

Project-related demolition, excavation, grading, and other construction activities may cause wind-blown dust that could contribute PM into the local atmosphere. Despite the established Federal standards for air pollutants and ongoing implementation of State and regional air quality control plans, air pollutants continue to have impacts on human health throughout the country.

Dust can be an irritant causing watering eyes or irritation to the lungs, nose, and throat. Demolition, excavation, grading, and other construction activities can cause wind-blown dust that adds PM to the local atmosphere. Depending on exposure, adverse health effects can occur due to this PM in general as well as due to specific contaminants, such as lead or asbestos that may be constituents of dust.

In response to these concerns, the San Francisco Board of Supervisors approved a series of amendments to the San Francisco Building and Health Codes, generally referred hereto as the Construction Dust Control Ordinance (Ordinance 176-08, effective July 30, 2008), with the intent of reducing the quantity of dust generated during site preparation, demolition, and overall construction work in order to protect the health of the general public and onsite workers, to minimize public nuisance complaints, and to avoid orders to stop work by DBI. The Dust Control Ordinance would be applicable for the portion of the project site that is outside Port jurisdiction (Hoe Down Yard). For portions of the project site under the jurisdiction of the Port (20th/Illinois Parcel and 28-Acre Site), Section 1247 of Article 22B of the Public Health Code requires that all city agencies that authorize construction or other improvements on City property

adopt rules and regulations to ensure that the dust control requirements of Article 22B are followed. The DBI will not issue a building permit without written notification from the Director of Public Health that the applicant has a site-specific dust control plan, unless the Director waives the requirement. The site-specific dust control plan would require the project sponsor to submit a map to the Director of Public Health showing all sensitive receptors within 1,000 feet of the site. If the project is determined to be within 1,000 feet of sensitive receptors, a site-specific dust control plan shall be submitted to the Director of Health. This plan shall contain the following measures specified in Section 106.3.2.6.3 of the Building Code: designate an individual who will be responsible for monitoring compliance with dust control requirements; water all active construction areas sufficiently to prevent dust from becoming airborne, using reclaimed water whenever possible; during excavation and dirt-moving activities, wet sweep or vacuum streets and sidewalks where work is in process; cover any inactive stockpiles; and use dust enclosures, curtains, and dust collectors as necessary.

In addition, the site-specific dust control plan may require the project sponsor to wet down areas of soil at least three times per day; provide an analysis of wind direction and install upwind and downwind particulate dust monitors; record particulate monitoring results; hire an independent, third-party to conduct inspections and keep a record of those inspections; establish shut-down conditions based on wind, soil migration, etc.; establish a hotline for surrounding community members who may be potentially affected by project-related dust; limit the area subject to construction activities at any one time; install dust curtains and windbreaks on the property lines, as necessary; limit the amount of soil in hauling trucks to the size of the truck bed and securing with a tarpaulin; enforce a 15 mph speed limit for vehicles entering and exiting construction areas; sweep affected streets with water sweepers at the end of the day; install and use wheel washers to clean truck tires; terminate construction activities when winds exceed 25 mph; and sweep off adjacent streets to reduce particulate emissions. Inactive stockpiles (where no disturbance occurs for more than 7 days) greater than 10 cubic yards or 500 square feet of excavated material, backfill material, import material, gravel, sand, road base, and soil shall be covered with a 10 mil (0.01 inch) polyethylene plastic (or equivalent) tarp, braced down, or other equivalent soil stabilization techniques should be used. Reclaimed water must be used for dust suppression watering, when required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code. Even if not required, reclaimed water should be used whenever possible. Contractors shall provide as much water as necessary to control dust (without creating run-off in any area of land clearing, and/or earth movement).

Implementation of dust control measures in compliance with the regulations and procedures set forth by the San Francisco Dust Control Ordinance would ensure that potential dust-related construction air quality impacts of the Proposed Project would be less than significant.

Criteria Air Pollutants

Methodology – Construction Emissions

Construction-related emissions of criteria air pollutants were calculated using the CalEEMod emissions calculator model (version 2013.2.2) developed for the California Air Pollution Control Officers Association. Although the project sponsors provided illustrative information on estimated sequences of phase construction, project-specific off-road equipment types are not known at this stage of project development. Consequently, the air quality analysis used default off-road equipment types represented in the CalEEMod model[52] as assumptions for each phase.

On-road haul truck traffic would primarily consist of material delivery to the site and removal of demolition and excavation materials. Approximately 325,000 cubic yards of soil would be hauled away from the entire site for all five phases of construction, resulting in a maximum of 80 round trips per day (160 one-way trips), including both soil off-haul and demolition spoils. These soil haul trips were allocated to the site preparation and grading phases of construction. Additional trucks would be required for concrete delivery, plus vendor trips allocated to the building construction phases of the construction periods.

Construction of the Proposed Project would occur in five phases over an up to 11-year period and buildings constructed in a given phase would be occupied after completion of that phase. Phases 1 and 2 are assumed to commence construction in 2018, Phase 3 in 2021, Phase 4 in 2024, and Phase 5 in 2027. During construction of Phase 3, Phases 1 and 2 are assumed to be operational. Therefore, the analysis adds together the construction emissions of Phase 3 and the operational emissions of Phases 1 and 2. The phases may not be undertaken exactly as laid out in the phasing diagram, so these emissions estimates are designed to provide a representative approximation. The CalEEMod model output reports as well as summary sheets detailing input values are provided in the AQTR in Appendix D.

Methodology – Operational Emissions

The Proposed Project would generate operational emissions from a variety of sources, including stationary sources (diesel emergency generators); area sources (natural gas combustion in boilers/heaters, and stoves, consumer products, architectural coatings, and landscape equipment); and from mobile sources (daily automobile and truck trips). Potential emissions from 11 emergency diesel generators (stationary sources) were estimated based on CARB/EPA Tier 2

[52] On August 5, 2013, BAAQMD notified the public via its website that all future CEQA analysis of criteria pollutant emissions should be conducted using CalEEMod. However, this notification is no longer posted.

emission standards, conservatively assuming that each parcel with designated building height limits in excess of 70 feet would require such equipment. Currently, the project applicant does not have specifications for potential generators. It was assumed that proposed generators would be 400 horsepower units and would meet the Federal Tier 2 diesel engine standards for PM for diesel engines with a rating between 75 and 750 horsepower and operate 50 hours per year (consistent with BAAQMD permitting limits). Project operational emissions of criteria pollutants from vehicle, stationary (backup generators), and area sources are summed to determine total operational emissions. Ultimately, the vast majority (98 percent) of operational emissions are from mobile emissions (54 percent) and area sources (43 percent). The area source emission component is primarily attributable to the use of consumer products by building occupants (77 percent) and the application of paints and other architectural coatings for maintenance purposes (18 percent).

Area-source and energy emissions were calculated using CalEEMod model based on the type and size of land uses associated with the Proposed Project, including the number of estimated residents. Area sources include natural gas combustion in stoves, hearths, consumer products, area architectural coatings, and landscaping equipment. San Francisco County-specific consumer product emission rate data were used in the CalEEMod model to estimate daily VOC emissions.

Mobile-source emissions would result from vehicle trips (auto and truck) associated with the Proposed Project and were also calculated using the CalEEMod model based on the number of vehicle trips identified in the transportation impact study prepared for the project.[53] Operational emission calculations for entrained road dust are based on San Francisco-specific silt loadings.[54]

The detailed quantification of operational-related criteria air pollutant emissions was conducted for the Proposed Project for both the Maximum Residential Scenario and the Maximum Commercial Scenario at project build out, year 2030, as well as at the completion of each incremental phase of construction, in 2020 (after completion of Phase 1), 2022 (completion of Phase 2), 2025 (completion of Phase 3), and 2028 (completion of Phase 4). The criteria air pollutant significance thresholds are based on levels by which a project would contribute considerably to significant air quality impacts (the project being the sum of the emissions at any one time, whether the emissions are from operation or construction is inconsequential to the effect on the air basin). Consequently, operational emissions are added to construction emissions when they would occur simultaneously, to disclose and analyze the air quality impacts of the whole project.

[53] Fehr & Peers, Transportation Impact Study, Pier 70 Waterfront Site Special Use District (SUD) Project, Screencheck Draft, December 2016.

[54] CARB, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust, Revised April 2014.

Maximum Residential Scenario

Table 4.G.6: Unmitigated Average Daily and Maximum Annual Emissions for the Maximum Residential Scenario During Construction, presents construction-period emissions for the Maximum Residential Scenario, which, due to the concurrent construction and operation of the project, are calculated in terms of average daily emissions and worse case maximum annual emissions.

Construction of the Maximum Residential Scenario would result in emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$ that would be below the thresholds of significance when considered alone. However, future construction phases (Phases 3, 4, and 5) would occur when operational emissions would also be generated by the earlier phases.

As shown in Table 4.G.6, construction-related emissions during concurrent construction of Phases 1 and 2 which includes development of the entirety of the Illinois Parcels would be less than significant. Additionally, after completion and occupancy of Phase 1 and the continuation of Phase 2 construction, the combined construction-related and operational emissions would be less than significant. However, construction of Phase 3, when considered with occupancy and operation of Phases 1 and 2, would result in emissions of ROG and NOx that would exceed significance thresholds, while emissions of PM_{10} and $PM_{2.5}$ would be below their respective thresholds.

Construction of Phase 4 and Phase 5 when considered with occupancy and operation of earlier phases would also result in emissions of ROG and NOx that would exceed significance thresholds, while emissions of PM_{10} would be meet the threhold with Phase 5 construction and $PM_{2.5}$ emissions would be below thresholds.

Therefore, unmitigated criteria pollutant emissions from the Maximum Residential Scenario during simultaneous construction and operation would be a significant air quality impact.

MAXIMUM COMMERCIAL SCENARIO

Table 4.G.7: Unmitigated Average Daily and Maximum Annual Emissions for the Maximum Commercial Scenario During Construction, presents construction-period emissions for the Maximum Construction Scenario. As shown in Table 4.G.7, construction-related emissions during concurrent construction of Phases 1 and 2 which include development of the entirety of the Illinois Parcels would be less than significant, as would the continued construction of Phase 2 with completion and occupancy of Phase 1. However, construction of Phase 3 when considered with occupancy and operation of Phases 1 and 2 would result in emissions of ROG and NOx that would exceed significance thresholds, while emissions of PM_{10} and $PM_{2.5}$ would be below their respective thresholds.

Table 4.G.6: Unmitigated Average Daily and Maximum Annual Emissions for the Maximum Residential Scenario During Construction

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction	**22**	**42**	**1.9**	**1.8**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1)	23	33	1.6	1.5
Phase 1 Operation	10	6.0	3.1	1.1
Phase 2 Total	**33**	**39**	**4.7**	**2.6**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 3 Construction	21	28	1.2	1.1
Phases 1 and 2 Operation	65	47	29	9.5
Phase 3 Total	**86**	**75**	**31**	**11**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
Phase 4 Construction	25	24	0.9	0.9
Phases 1, 2, and 3 Operation	102	64	49	16
Phase 4 Total	**127**	**88**	**50**	**17**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
Phase 5 Construction	12	18	0.7	0.6
Phases 1, 2, 3, and 4 Operation	156	93	81	26
Phase 5 Total	**168**	**111**	**82**	**27**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No

Table 4.G.6 Continued

	Maximum Annual Emissions (ton/year)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction	**4.6**	**8.2**	**0.34**	**0.32**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1)	4.6	5.0	0.23	0.22
Phase 1 Operation	1.8	1.1	0.56	0.19
Phase 2 Total	**6.4**	**6.1**	**0.79**	**0.41**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 3 Construction	5.1	3.7	0.16	0.15
Phases 1 and 2 Operation	12	8.6	5.4	1.7
Phase 3 Total	**17**	**12**	**5.6**	**1.9**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No
Phase 4 Construction	6.2	3.6	0.13	0.12
Phase 1, 2, and 3 Operation	19	12	9.0	2.9
Phase 4 Total	**25**	**16**	**9.1**	**3.0**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No
Phase 5 Construction	2.9	2.7	0.11	0.10
Phases 1, 2, 3, and 4 Operation	29	17	15	4.7
Phase 5 Total	**32**	**20**	**15**	**4.8**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	Yes	No

Notes: Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold, then the exceedance is identified by a bolded "Yes" response.

For each construction phase, annual emissions are divided over the number of construction days for the given phase, to determine the average daily emissions. Phases 1 and 2 would be constructed concurrently. Phase durations as estimated by the applicant were 780 days for all phases except Phase 1 which would be less intensive. Phase 1 duration estimatd using CalEEMod default values as this data was not available.

Source: ESA, 2016

Table 4.G.7: Unmitigated Average Daily and Maximum Annual Emissions for the Maximum Commercial Scenario During Construction

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction	**24**	**42**	**1.9**	**1.8**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1)	25	34	1.6	1.5
Phase 1 Operation	10	6.0	3.1	1.1
Phase 2 Total	**35**	**40**	**4.7**	**2.6**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 3 Construction	20	28	1.2	1.1
Phases 1 and 2 Operation	70	49	32	10
Phase 3 Total	**90**	**77**	**33**	**11**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
Phase 4 Construction	21	24	0.9	0.9
Phase 1, 2, and 3 Operation	115	73	58	18
Phase 4 Total	**136**	**97**	**59**	**19**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
Phase 5 Construction	10	18	0.7	0.6
Phase 1, 2, 3, and 4 Operation	161	93	88	27
Phase 5 Total	**171**	**111**	**89**	**28**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	**Yes**	No

Table 4.G.7 Continued

	Maximum Annual Emissions (ton/year)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction	**5.1**	**8.2**	**0.33**	**0.32**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1)	5.0	5.2	0.24	0.23
Phase 1 Operation	1.8	1.1	0.56	0.19
Phase 2 Total	**6.8**	**6.3**	**0.80**	**0.42**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 3 Construction	5.0	3.8	0.16	0.15
Phases 1 and 2 Operation	13	9.0	5.9	1.9
Phase 3 Total	**18**	**13**	**6.1**	**2.1**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No
Phase 4 Construction	5.2	3.6	0.13	0.12
Phases 1, 2, and 3 Operation	21	13	11	3.3
Phase 4 Total	**26**	**17**	**11**	**3.4**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	**Yes**	No
Phase 5 Construction	2.3	2.8	0.11	0.10
Phases 1, 2, 3, and 4 Operation	30	17	16	4.9
Phase 5 Total	**32**	**20**	**16**	**5.0**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	**Yes**	No

Notes: Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold, then the exceedance is identified by a bolded "Yes" response.

For each construction phase, annual emissions are divided over the number of construction days for the given phase, to determine the average daily emissions. Phases 1 and 2 would be constructed concurrently. Phase durations as estimated by the applicant were 780 days for all phases except Phase 1 which would be less intensive. Phase 1 duration estimated using CalEEMod default values as this data was not available.

Source: ESA, 2016

Construction of Phase 4 when considered with occupancy and operation of earlier phases would result in emissions of ROG and NOx that would exceed significance thresholds, while emissions of PM_{10} and $PM_{2.5}$ would be below the applicable thresholds. Construction of Phase 5 when considered with occupancy and operation of earlier phases would result in emissions of ROG, NOx, and PM_{10} that would exceed significance thresholds, while emissions of $PM_{2.5}$ would be below the applicable threshold.

Therefore, criteria pollutant emissions during simultaneous construction and operation of the Maximum Commercial Scenario would be significant.

Generally the Maximum Commercial Scenario results in a marginal 1 to 6 percent greater emissions than the Maximum Residential Scenario, depending on the year analyzed and whether average pounds per day or maximum tons per year are considered. Regardless, under the Maximum Commercial Scenario emissions of ROG, NOx, and PM_{10} would exceed significance thresholds, while emissions of $PM_{2.5}$ would be below the applicable threshold

Health Implications of Significant Impacts Related to Emissions of Ozone Precursors and PM_{10}

ROG and NOx are ozone precursors, and the main health concern of exposure to ground-level ozone is effects on the respiratory system, especially on lung function. Several factors influence these health impacts, including the concentrations of ground-level ozone in the atmosphere, the duration of exposure, average volume of air breathed per minute, the length of intervals between short-term exposures, and the sensitivity of the person to the exposure.[55,56] The concentration of ground-level ozone in the atmosphere is influenced by the volume of air available for dilution, the temperature, and the intensity of ultraviolet light. In the Bay Area, the worst case conditions for ozone formation occur in the summer and early fall on warm, windless, sunny days.[57]

PM_{10} consists of particulates that are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the CARB, studies in the United States and elsewhere "have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks," and studies

[55] The World Bank Group, *Pollution Prevention and Abatement Handbook 1998: Toward Cleaner Production*, pp. 227–230, 1999. Available online at www.ifc.org/wps/wcm/connect/dd7c9800488553e0b0b4f26a6515bb18/HandbookGroundLevelOzone.pdf?MOD=AJPERES. Accessed January 19, 2016.

[56] U.S. Environmental Protection Agency, *Air Quality Guide for Ozone*, March 2008. Available online at www.airnow.gov/index.cfm?action=pubs.aqiguideozone. Accessed January 19, 2016.

[57] BAAQMD, *Air Pollutants Regulated by the Air District*. Available online at http://hank.baaqmd.gov/dst/pollutants.htm. Accessed January 19, 2016.

of children's health in California have demonstrated that particle pollution "may significantly reduce lung function growth in children." The CARB also reports that statewide attainment of PM standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.[58] High levels of PM can exacerbate chronic respiratory ailments, such as bronchitis and asthma, and have been associated with increased emergency room visits and hospital admissions. $PM_{2.5}$ is of particular concern because epidemiologic studies have demonstrated that people who live near freeways and high-traffic roadways have poorer health outcomes, including increased asthma symptoms and respiratory infections and decreased pulmonary function and lung development in children.[59]

Given these various factors, it is difficult to predict the magnitude of health effects from the project's exceedance of significance criteria for regional ROG, NOx, and PM_{10} emissions. The increase in emissions associated with the Proposed Project represents a fraction of total SFBAAB regional ROG emissions (up to 186 pounds per day compared to 265 tons per day in the SFBAAB region in 2012),[60] NOx emissions (up to 111 pounds per day compared to 318 tons per day in the SFBAAB region in 2012), and PM_{10} emissions (up to 165 pounds per day compared to 119 tons per day in the SFBAAB region in 2012). Although Table 4.G.1, p. 4.G.3, indicates that the most stringent applicable ozone standards were not exceeded at the Potrero Hill monitoring station between 2011 and 2015, the SFBAAB region experienced an average of 8.4 days of exceedance per year between 2011 and 2015.[61] The PM_{10} standard was exceeded on one day at the Potrero Hill monitoring station between 2011 and 2015. The Proposed Project's ROG, NOx, and PM_{10} increases could contribute to new or exacerbated air quality violations in the SFBAAB region by contributing to more days of ozone or PM_{10} exceedance or result in AQI values that are unhealthy for sensitive groups and other populations. As shown in Table 4.G.3, p. 4.G.10, the SFBAAB has averaged between 8 and 15 days per year that are considered unhealthy for sensitive groups and had 3 unhealthy (red) days in the last 5 years for which data are available.

[58] CARB, *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution*, November 2007

[59] San Francisco Department of Public Health, *Assessment and Mitigation of Air Pollutant Health Effect from Intra-urban Roadways: Guidance for Land Use Planning and Environmental Review*, May 2008, p. 7.

[60] CARB, *The California Almanac of Emissions and Air Quality – 2013 Edition*, May 21, 2014. Available online at www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm. Accessed January 19, 2016.

[61] BAAQMD, *Annual Bay Area Air Quality Summaries*, 2014. Available online at http://www.baaqmd.gov/about-air-quality/air-quality-summaries. Accessed January 19, 2016.

On unhealthy days, persons are recommended to avoid both prolonged and heavy-exertion outdoor activities.[62]

Mitigation of Construction-Related and Operational Air Quality Impacts

To address ROG, NOx, and PM_{10} emissions that would occur during construction of the Proposed Project under both the Maximum Residential and Maximum Commercial Scenarios, Mitigation Measure M-AQ-1a: Construction Emissions Minimization, shown below, has been identified and would apply during construction of Phases 3, 4, and 5, or after build-out of 1.3 million gross square feet of development, whichever comes first.

Mitigation Measure M-AQ-1a: Construction Emissions Minimization

A. *Construction Emissions Minimization Plan.* Prior to issuance of a site permit, the project sponsors shall submit a Construction Emissions Minimization Plan (Plan) to the Environmental Review Officer (ERO) for review and approval by an Environmental Planning Air Quality Specialist. The Plan shall detail project compliance with the following requirements:

1. Where access to alternative sources of power is available, portable diesel generators used during construction shall be prohibited. Where portable diesel engines are required because alternative sources of power are not available, the diesel engine shall meet the EPA or CARB Tier 4 off-road emission standards and be fueled with renewable diesel (at least 99 percent renewable diesel or R99), if commercially available, as defined below.

2. All off-road equipment greater than 25 horsepower that operates for more than 20 total hours over the entire duration of construction activities shall have engines that meet the EPA or CARB Tier 4 off-road emission standards and be fueled with renewable diesel (at least 99 percent renewable diesel or R99), if commercially available. If engines that comply with Tier 4 off-road emission standards are not commercially available, then the project sponsors shall provide the next cleanest piece of off-road equipment as provided by the step-down schedules in Table M-AQ-1.

[62] U.S. Environmental Protection Agency, *Air Quality Index, A Guide to Air Quality and Your Health*, February 2014. Available online at www.epa.gov/airnow/aqi_brochure_02_14.pdf. Accessed January 19, 2016.

Table M.AQ.1: Off-Road Equipment Compliance Step-Down Schedule

Compliance Alternative	Engine Emission Standard	Emissions Control
1	Tier 3	CARB PM VDECS (85%)[1]
2	Tier 2	CARB PM VDECS (85%)

How to use the table: If the requirements of (A)(2) cannot be met, then the project sponsors would need to meet Compliance Alternative 1. Should the project sponsors not be able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 would need to be met.

[1] CARB, Currently Verified Diesel Emission Control Strategies (VDECS). Available online at http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm. Accessed January 14, 2016.

i. With respect to Tier 4 equipment, "commercially available" shall mean the availability taking into consideration factors such as: (i) critical path timing of construction; and (ii) geographic proximity of equipment to the project site.

ii. With respect to renewable diesel, "commercially available" shall mean the availability taking into consideration factors such as: (i) critical path timing of construction; (ii) geographic proximity of fuel source to the project site; and (iii) cost of renewable diesel is within 10 percent of Ultra Low Sulfur Diesel #2 market price.

iii. The project sponsors shall maintain records concerning its efforts to comply with this requirement. Should the project sponsor determine either that an off-road vehicle that meets Tier 4 emissions standards or that renewable diesel are not commercially available, the project sponsor shall submit documentation to the satisfaction of the ERO and, for the former condition, shall identify the next cleanest piece of equipment that would be use, in compliance with Table M-AQ-1-1.

3. The project sponsors shall ensure that future developers or their contractors require the idling time for off-road and on-road equipment be limited to no more than 2 minutes, except as provided in exceptions to the applicable State regulations regarding idling for off-road and on-road equipment. Legible and visible signs shall be posted in multiple languages (English, Spanish, and Chinese) in designated queuing areas and at the construction site to remind operators of the 2-minute idling limit.

4. The project sponsors shall require that each construction contractor mandate that construction operators properly maintain and tune equipment in accordance with manufacturer specifications.

5. The Plan shall include best available estimates of the construction timeline by phase with a description of each piece of off-road equipment required for every construction phase and shall be updated pursuant to the reporting requirements in Section B below. Reporting requirements for off-road equipment descriptions

and information shall include as much detail as is available, but are not limited to: equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel usage and hours of operation. For Verified Diesel Emission Control Strategies (VDECS) installed, descriptions and information shall include technology type, serial number, make, model, manufacturer, CARB verification number level, and installation date and hour meter reading on installation date. The Plan shall also indicate whether renewable diesel will be used to power the equipment. The Plan shall also include anticipated fuel usage and hours of operation so that emissions can be estimated.

6. The project sponsors and their construction contractors shall keep the Plan available for public review on site during working hours. Each construction contractor shall post at the perimeter of the project site a legible and visible sign summarizing the requirements of the Plan. The sign shall also state that the public may ask to inspect the Plan at any time during working hours, and shall explain how to request inspection of the Plan. Signs shall be posted on all sides of the construction site that face a public right-of-way. The project sponsors shall provide copies of the Plan to members of the public as requested.

B. *Reporting.* Quarterly reports shall be submitted to the ERO indicating the construction activities undertaken and information about the off-road equipment used, including the information required in Section A(5). In addition, reporting shall include the approximate amount of renewable diesel fuel used.

Within 6 months of the completion of all project construction activities, the project sponsors shall submit to the ERO a final report summarizing construction activities. The final report shall indicate the start and end dates and duration of each construction phase. The final report shall include detailed information required in Section A(5). In addition, reporting shall include the actual amount of renewable diesel fuel used.

C. *Certification Statement and On-site Requirements.* Prior to the commencement of construction activities, the project sponsors shall certify through submission of city-standardized forms (1) compliance with the Plan, and (2) all applicable requirements of the Plan have been incorporated into contract specifications.

Residual Impact with Implementation of Mitigation Measure M-AQ-1a

Mitigation Measure M-AQ-1a would result in a reduction of construction-related ROG emissions ranging from 8 to 10 percent, depending on the construction phase. Emissions of construction-related NOx would be reduced by 54 to 64 percent and emissions of construction-related PM_{10} would be reduced between 72 and 83 percent. Construction emissions alone would be less than significance thresholds. Emissions of simultaneous operational and construction emissions would still exceed thresholds but would be substantially reduced by this measure. Additionally, as discussed later in Impact AQ-3, particulate emission reductions from this measure are necessary to reduce potential health risk impacts to on-site receptors to less than significant levels. Implementation of this mitigation measure would not result in any adverse environmental effects.

To address emissions that would occur during operation of the Proposed Project, the following mitigation measures, have been identified: M-AQ-1b: Diesel Backup Generator Specifications; M-AQ-1c: Use Low- and Super-Compliant VOC Architectural Coatings in Maintaining Buildings through Covenants Conditions and Restrictions (CC&Rs) and Ground Lease; M-AQ-1d: Promote Use of Green Consumer Products; M-AQ-1e: Electrification of Loading Docks; M-AQ-1f: Transportation Demand Management; M-AQ-1g: Additional Mobile Source Control Measures; and M-AQ-1h: Offset Operational Emissions.

M-AQ-1b: Diesel Backup Generator Specifications

To reduce NOx associated with operation of the Maximum Commercial or Maximum Residential Scenarios, the project sponsors shall implement the following measures.

A. All new diesel backup generators shall:

   1. have engines that meet or exceed CARB Tier 4 off-road emission standards which have the lowest NOx emissions of commercially available generators; and

   2. be fueled with renewable diesel, if commercially available, which has been demonstrated to reduce NOx emissions by approximately 10 percent.

B. All new diesel backup generators shall have an annual maintenance testing limit of 50 hours, subject to any further restrictions as may be imposed by the BAAQMD in its permitting process.

C. For each new diesel backup generator permit submitted to BAAQMD for the project, anticipated location, and engine specifications shall be submitted to the San Francisco Planning Department for review and approval prior to issuance of a permit for the generator from the San Francisco DBI or the Port. Once operational, all diesel backup generators shall be maintained in good working order for the life of the equipment and any future replacement of the diesel backup generators shall be required to be consistent with these emissions specifications. The operator of the facility at which the generator is located shall maintain records of the testing schedule for each diesel backup generator for the life of that diesel backup generator and provide this information for review to the Planning Department within 3 months of requesting such information.

Residual Impact with Implementation of Mitigation Measure M-AQ-1b

Mitigation Measure M-AQ-1b would result in an 86 percent reduction of ROG emissions from generators. Emissions of NOx emissions from generators would be reduced by 89 percent and emissions of PM_{10} would be reduced by 98 percent. Operational emissions would still exceed thresholds as the overall contribution of generator emissions to total project emissions is very small. However, as discussed later in Impact AQ-3, particulate emission reductions from this measure are necessary to reduce potential health risk impacts to on-site receptors to less than significant levels. Implementation of this mitigation measure would not result in any adverse environmental effects.

M-AQ-1c: Use Low- and Super-Compliant VOC Architectural Coatings in Maintaining Buildings through Covenants Conditions and Restrictions (CC&Rs) and Ground Lease

The project sponsors shall require all developed parcels to include within their CC&Rs and/or ground leases requirements for all future interior spaces to be repainted only with "Super-Compliant" Architectural Coatings (http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings). "Low-VOC" refers to paints that meet the more stringent regulatory limits in South Coast AQMD Rule 1113; however, many manufacturers have reformulated to levels well below these limits. These are referred to as "Super-Compliant" Architectural Coatings.

Residual Impact with Implementation of Mitigation Measure M-AQ-1c

Regulation 8 Rule 3 of the BAAQMD places limits on the VOC content of paint and other architectural coatings, and use of lower VOC coatings available to consumers can further reduce operational ROG emissions. Low- and Super-Compliant VOC paints are manufactured and sold by numerous companies. ROG emissions associated with maintenance application of paint and other architectural coatings represent a relatively small percentage (8 percent) of total project ROG emissions. Mitigation Measure M-AQ-1c would reduce ROG emissions associated with maintenance application of paint and other architectural coatings by 31 percent. Operational emissions would still exceed thresholds as the overall contribution of architectural coating emissions to total project emissions is comparatively small. Should the applicant commit to requiring use of no-VOC interior paints, ROG emissions from maintenance application of paint and other architectural coatings could be further reduced by up to 90 percent. Implementation of this mitigation measure would not result in any adverse environmental effects.

M-AQ-1d: Promote Use of Green Consumer Products

The project sponsors shall provide education for residential and commercial tenants concerning green consumer products. Prior to receipt of any certificate of final occupancy and every 5 years thereafter, the project sponsors shall work with the San Francisco Department of Environment (SF Environment) to develop electronic correspondence to be distributed by email annually to residential and/or commercial tenants of each building on the project site that encourages the purchase of consumer products that generate lower than typical VOC emissions. The correspondence shall encourage environmentally preferable purchasing and shall include contact information and website links to SF Approved. This website also may be used as an informational resource by businesses and residents.

Residual Impact with Implementation of Mitigation Measure M-AQ-1d

SF Approved (sfapproved.org) is administrated by SF Environment, and identifies products and services that are required and recommended for use by City departments in connection with the City's Precautionary Purchasing Ordinance (Section 203 of the San Francisco Environment

Code). Mitigation Measure M-AQ-1d would reduce ROG emissions associated with use of consumer products. Given that the project applicant does not have authority to require use of certain products, no reduction in ROG emissions can be estimated from this measure. Implementation of this mitigation measure would not result in any adverse environmental effects.

M-AQ-1e: Electrification of Loading Docks

The project sponsors shall ensure that loading docks for retail, light industrial, or warehouse uses that will receive deliveries from refrigerated transport trucks incorporate electrification hook-ups for transportation refrigeration units to avoid emissions generated by idling refrigerated transport trucks.

Residual Impact with Implementation of Mitigation Measure M-AQ-1e

Mitigation Measure M-AQ-1e would reduce emissions of ROG, NOx, and PM_{10}. Given that the specific land uses are not determined, no reduction in emissions can be reliably estimated from this measure at this time. Implementation of this mitigation measure would not result in any adverse environmental effects.

M-AQ-1f: Transportation Demand Management

The project sponsors shall prepare and implement a Transportation Demand Management (TDM) Plan with a goal of reducing estimated one-way vehicle trips by 20 percent compared to the total number of one-way vehicle trips identified in the project's Transportation Impact Study at project build-out. To ensure that this reduction goal could be reasonably achieved, the TDM Plan will have a monitoring goal of reducing by 20 percent the one-way vehicle trips calculated for each building that has received a Certificate of Occupancy and is at least 75% occupied compared to the one-way vehicle trips anticipated for that building based on anticipated development on that parcel, using the trip generation rates contained within the project's Transportation Impact Study. There shall be a Transportation Management Association that would be responsible for the administration, monitoring, and adjustment of the TDM Plan. The project sponsor is responsible for identifying the components of the TDM Plan that could reasonably be expected to achieve the reduction goal for each new building associated with the project, and for making good faith efforts to implement them. The TDM Plan may include, but is not limited to, the types of measures summarized below for explanatory example purposes. Actual TDM measures selected should include those from the TDM Program Standards, which describe the scope and applicability of candidate measures in detail and include:

- Active Transportation: Provision of streetscape improvements to encourage walking, secure bicycle parking, shower and locker facilities for cyclists, subsidized bike share memberships for project occupants, bicycle repair and maintenance services, and other bicycle-related services;
- Car-Share: Provision of car-share parking spaces and subsidized memberships for project occupants;

- Delivery: Provision of amenities and services to support delivery of goods to project occupants;
- Family-Oriented Measures: Provision of on-site childcare and other amenities to support the use of sustainable transportation modes by families;
- High-Occupancy Vehicles: Provision of carpooling/vanpooling incentives and shuttle bus service;
- Information and Communications: Provision of multimodal wayfinding signage, transportation information displays, and tailored transportation marketing services;
- Land Use: Provision of on-site affordable housing and healthy food retail services in underserved areas;
- Parking: Provision of unbundled parking, short term daily parking provision, parking cash out offers, and reduced off-street parking supply.

The TDM Plan shall include specific descriptions of each measure, including the degree of implementation (e.g., for how long will it be in place, how many tenants or visitors will it benefit, on which locations within the site will it be placed, etc.), and the population that each measure is intended to serve (e.g. residential tenants, retail visitors, employees of tenants, visitors, etc.). It shall also include a commitment to monitoring of person and vehicle trips traveling to and from the project site to determine the TDM Plan's effectiveness, as outlined below.

The TDM Plan shall be submitted to the City to ensure that components of the TDM Plan intended to meet the reduction target are shown on the plans and/or ready to be implemented upon the issuance of each certificate of occupancy.

TDM Plan Monitoring and Reporting: The Transportation Management Association, through an on-site Transportation Coordinator, shall collect data and make monitoring reports available for review and approval by the Planning Department staff.

- Timing: Monitoring data shall be collected and reports shall be submitted to Planning Department staff every year (referred to as "reporting periods"), until five consecutive reporting periods display the project has met the reduction goal, at which point monitoring data shall be submitted to Planning Department staff once every three years. The first monitoring report is required 18 months after issuance of the First Certificate of Occupancy for buildings that include off-street parking or the establishment of surface parking lots or garages that bring the project's total number of off-street parking spaces to greater than or equal to 500. Each trip count and survey (see below for description) shall be completed within 30 days following the end of the applicable reporting period. Each monitoring report shall be completed within 90 days following the applicable reporting period. The timing shall be modified such that a new monitoring report shall be required 12 months after adjustments are made to the TDM Plan in order to meet the reduction goal, as may be required in the "TDM Plan Adjustments" heading below. In addition, the timing may be modified by the Planning Department as needed to consolidate this requirement with other monitoring and/or reporting requirements for the project.

- Components: The monitoring report, including trip counts and surveys, shall include the following components OR comparable alternative methodology and components as approved or provided by Planning Department staff:
    - Trip Count and Intercept Survey: Trip count and intercept survey of persons and vehicles arriving and leaving the project site for no less than two days of the reporting period between 6:00 a.m. and 8:00 p.m. One day shall be a Tuesday, Wednesday, or Thursday during one week without federally recognized holidays, and another day shall be a Tuesday, Wednesday, or Thursday during another week without federally recognized holidays. The trip count and intercept survey shall be prepared by a qualified transportation or qualified survey consultant and the methodology shall be approved by the Planning Department prior to conducting the components of the trip count and intercept survey. It is anticipated that the Planning Department will have a standard trip count and intercept survey methodology developed and available to project sponsors at the time of data collection.
    - Travel Demand Information: The above trip count and survey information shall be able to provide travel demand analysis characteristics (work and non-work trip counts, origins and destinations of trips to/from the project site, and modal split information) as outlined in the Planning Department's *Transportation Impact Analysis Guidelines for Environmental Review*, October 2002, or subsequent updates in effect at the time of the survey.
    - Documentation of Plan Implementation: The TDM Coordinator shall work in conjunction with the Planning Department to develop a survey (online or paper) that can be reasonably completed by the TDM Coordinator and/or TMA staff to document the implementation of TDM program elements and other basic information during the reporting period. This survey shall be included in the monitoring report submitted to Planning Department staff.
    - Assistance and Confidentiality: Planning Department staff will assist the TDM Coordinator on questions regarding the components of the monitoring report and shall ensure that the identity of individual survey responders is protected.

TDM Plan Adjustments. The TDM Plan shall be adjusted based on the monitoring results if three consecutive reporting periods demonstrate that measures within the TDM Plan are not achieving the reduction goal. The TDM Plan adjustments shall be made in consultation with Planning Department staff and may require refinements to existing measures (e.g., change to subsidies, increased bicycle parking), inclusion of new measures (e.g., a new technology), or removal of existing measures (e.g., measures shown to be ineffective or induce vehicle trips). If three consecutive reporting periods' monitoring results demonstrate that measures within the TDM Plan are not achieving the reduction goal, the TDM Plan adjustments shall occur within 270 days following the last consecutive reporting period. The TDM Plan adjustments shall occur until three consecutive reporting periods' monitoring results demonstrate that the reduction goal is achieved. If the TDM Plan does not achieve the reduction goal then the City shall impose additional measures to reduce vehicle trips as prescribed under the development agreement, which may include restriction of additional off-street parking spaces beyond those previously established on the site, capital or operational improvements intended to reduce vehicle trips from the project, or other measures that support sustainable trip

making, until three consecutive reporting periods' monitoring results demonstrate that the reduction goal is achieved.

Residual Impact with Implementation of Mitigation Measure M-AQ-1f

Mitigation Measure M-AQ-1f would reduce mobile source emissions of ROG, NOx, and PM_{10}. Quantification of emission reduction from this measure is based on a 20 percent reduction target for vehicle trips. Because most measures are expected to be employer-based, the 20 percent reduction in vehicle trips was calculated for weekday trips only. Although emission reductions would be substantial, operational emissions would still exceed thresholds. Implementation of this mitigation measure would encourage sustainable modes of transportation and the use of single-occupant vehicles would be discouraged, which would increase the use of taxi/rideshare, transit, bicycle and pedestrian modes. The impacts resulting from such a shift of vehicle trips to other modes are difficult to predict. If many vehicle trips were to shift to transit and pedestrian trips, it is possible that this mitigation measure could contribute to significant and unavoidable transit impacts (as discussed in Section 4.E, Transportation and Circulation), but not likely to a substantial degree. The potential for contributions to these other transportation modes as a result of this mitigation measure is speculative because it is unknown which specific TDM meausres would ultimately be selected. Moreover, current literature does not document which travel modes people would choose in respose to implementation of several TDM meaures. The proposed project would be required to pay the Transportation Sustainability Fee and fees to SFMTA as part of Mitigation Measure M-TR-5, to increase capacity on the 48 Quintara/24th Street bus route, pp. 4.E.91-4.E.93. Therefore, implementation of this mitigation measure would not cause any significant effects in addition to those that would result from implementation of the Proposed Project.

Mitigation Measure M-AQ-1g: Additional Mobile Source Control Measures

The following Mobile Source Control Measures from the BAAQMD's 2010 Clean Air Plan shall be implemented:

- Promote use of clean fuel-efficient vehicles through preferential (designated and proximate to entry) parking and/or installation of charging stations beyond the level required by the City's Green Building code, from 8 to 20 percent.
- Promote zero-emission vehicles by requesting that any car share program operator include electric vehicles within its car share program to reduce the need to have a vehicle or second vehicle as a part of the TDM program that would be required of all new developments.

Residual Impact with Implementation of Mitigation Measure M-AQ-1g

Mitigation Measure M-AQ-1g would marginally reduce mobile source emissions of ROG, NOx, and PM_{10}. No additional emissions reductions were quantified from implementation of this

mitigation measure. Implementation of this mitigation measure would not result in any adverse environmental effects.

Mitigation Measure M-AQ-1h: Offset Operational Emissions

Prior to issuance of the final certificate of occupancy for the final building associated with Phase 3 or after build out of 1.3 million square feet of development, whichever comes first, the project sponsors, with the oversight of the ERO, shall either:

(1) Directly fund or implement a specific offset project within San Francisco to achieve reductions the one-time reduction of 25 tons per year of ozone precursors and 1 ton of PM_{10}. This offset is intended to offset the estimated annual tonnage of operational ozone precursor and PM_{10} emissions under the buildout scenario realized at the time of completion of Phase 3. To qualify under this mitigation measure, the specific emissions offset project must result in emission reductions within the SFBAAB that would not otherwise be achieved through compliance with existing regulatory requirements. A preferred offset project would be one implemented locally within the City and County of San Francisco. Prior to implementation of the offset project, the project sponsors must obtain the ERO's approval of the proposed offset project by providing documentation of the estimated amount of emissions of ROG, NOx, and PM_{10} to be reduced (tons per year) within the SFBAAB from the emissions reduction project(s). The project sponsors shall notify the ERO within 6 months of completion of the offset project for verification; or

(2) Pay a one-time mitigation offset fee to the BAAQMD's Strategic Incentives Division in an amount no less than $18,030 per weighted ton of ozone precursors and PM_{10} per year above the significance threshold, calculated as the difference between total annual emissions at build out under mitigated conditions and the significance threshold in the EIR air quality analysis, which is 25 tons per year of ozone precursors and 1 ton of PM_{10}, plus a 5 percent administrative fee, to fund one or more emissions reduction projects within the SFBAAB. This one-time fee is intended to fund emissions reduction projects to offset the estimated annual tonnage of operational ozone precursor and PM_{10} emissions under the buildout scenario realized at the time of completion of Phase 3, or after completion of 1.3 million sf of development, whichever comes first. Documentation of payment shall be provided to the ERO.

Acceptance of this fee by the BAAQMD shall serve as an acknowledgment and commitment by the BAAQMD to implement one or more emissions reduction project(s) within 1 year of receipt of the mitigation fee to achieve the emission reduction objectives specified above, and provide documentation to the ERO and to the project sponsors describing the project(s) funded by the mitigation fee, including the amount of emissions of ROG, NOx, and PM_{10} reduced (tons per year) within the SFBAAB from the emissions reduction project(s). If there is any remaining unspent portion of the mitigation offset fee following implementation of the emission reduction project(s), the project sponsors shall be entitled to a refund in that amount from the BAAQMD. To qualify under this mitigation measure, the specific emissions retrofit project must result in emission reductions within the SFBAAB that would not otherwise be achieved through compliance with existing regulatory requirements.

Residual Impact with Implementation of Mitigation Measure M-AQ-1h

Mitigation Measure M-AQ-1h would offset emissions of ROG, NOx, and PM_{10} that would exceed the respective thresholds of significance for these pollutants. Implementation of the emissions reduction project could be conducted by the BAAQMD and is outside the jurisdiction and control of the City and not fully within the control of the project sponsor. M-AQ-1h also allows the project sponsor to directly fund or implement an offset project; however, no such project has yet been identified. Therefore, the residual impact of project emissions during construction is conservatively considered *significant and unavoidable with mitigation*, acknowledging the assumption that the project sponsor would implement Mitigation Measures M-AQ-a though M-AQ-1h (Emission Offsets). Although the specific offset projects are not known, it is anticipated that implementation of this mitigation measure would not result in any adverse environmental effects.

Residual Impact with Implementation of All Identified Mitigation Measures

Implementation of Mitigation Measure M-AQ-1a (Construction Emissions Minimization)**,** above, would substantially reduce construction-related emissions of ROG, NOx, and PM_{10}. The measure would require use of off-road equipment to meet the most tringent emission standards available and would reduce construction-related emissions of ROG, NOx, and PM_{10}. Mitigated daily engine exhaust emissions from construction activities associated with the Proposed Project with compliance with Tier 4 requirements are compared with emission significance thresholds in Table 4.G.8 for the Maximum Residential Scenario during Construction and in Table 4.G.9 for the Maximum Commercial Scenario during Construction. Both these tables assume mitigation reductions as previously described for each measure. As can be seen in these tables, criteria air pollutant emissions would remain significant during construction of Phases 3, 4, and 5 when operational emissions are also considered.

Mitigation Measures M-AQ-1b through M-AQ-1g above would reduce operational emissions associated with both the Maximum Residential Scenario and the Maximum Commercial Scenario. Quantifiable emission reductions from implementation of these measures are reflected in Tables 4.G.8 and 4.G.9 below for the Maximum Residential Scenario and the Maximum Commercial Scenario, respectively. Specifically, the following emissions reductions were quantified as a result of implementation of Mitigation Measures M-AQ-1b through M-AQ-1h:

- **M-AQ-1b: Diesel Backup Generator Specifications** – Quantification of the emission reduction from this measure is based on Tier 4 emission factors for emergency backup generators.
- **M-AQ-1c: Use Low- and Super-Compliant VOC Architectural Coatings in Maintaining Buildings through CC&Rs** – Quantification of the emission reduction from this measure for residential and commercial uses are conservatively based on 50

grams of ROG per liter for interior finsishes and 100 grams ROG per liter for exterior finishes rate for SCAQMD.

- **M-AQ-1d: Promote Use of Green Consumer Products** – Given that the project applicant does not have authority to require use of certain products, no reduction in ROG emissions are estimated from this measure.
- **M-AQ-1e: Electrification of Loading Docks** – Given that the specific land uses are not determined, no reduction in emissions can be reliably estimated from this measure at this time.
- **M-AQ-1f: Transportation Demand Management** – Quantification of the emission reduction from this measure is based on a 20 percent reduction target for vehicle trips. Because most measures are expected to be employer-based, the 20 percent reduction in vehicle trips were only taken for weekday employee trips.
- **Mitigation Measure M-AQ-1g: Additional Mobile Source Control Measures**- No additional emissions reductions were estimated from implementation of these mitigation measures.

Emissions of ROG and NOx during construction of Phases 3, 4, and 5 with consideration of concurrent operational emissions would remain significant even with implementation of Mitigation Measures M-AQ-1a through M-AQ-1g. Consequently, Mitigation Measure M-AQ-1h (Emissions Offsets) is identified to further reduce the residual pollutant emissions. Mitigation Measure M-AQ-1h would require the project sponsor to offset remaining emissions to below significance thresholds by funding the implementation of an offsite emissions reduction project in an amount sufficient to mitigate residual criteria pollutant emissions shown in Tables 4.G.8 and 4.G.9.

As specified in Mitigation Measure M-AQ-1h, offsetting of the project's emissions would follow completion of construction activities for Phases 1 and 2. If construction emissions were considered alone, without operational emissions, construction emissions would be less than significant. Consequently, emissions offsets would represent the necessary amount of offset required to also address operational emissions. Therefore, emissions reduction projects funded through Mitigation Measure M-AQ-1h would offset the regional criteria pollutant emissions generated by operation of the Proposed Project that would remain in excess of the applicable thresholds after implementation of the project-specific emission reductions required under Mitigation Measures M-AQ-1a through M-AQ-1g. If Mitigation Measure M-AQ-1h is implemented via a directly funded or implemented offset project, it could have the potential to reduce the impact to a less than significant level but only if the timing of the offsets could be documented prior to the occupancy of Phase 3 and ensured for the life of the project. Therefore, the residual impact of project emissions during construction is conservatively considered significant and unavoidable with mitigation, acknowledging the assumption that the project sponsor would implement Mitigation Measures M-AQ-1a though M-AQ-1h (Emission Offsets).

Table 4.G.8: Mitigated Average Daily and Maximum Annual Emissions for the Maximum Residential Scenario During Construction

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction[a]	**22**	**42**	**1.9**	**1.8**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1)[a]	23	33	1.6	1.5
Phase 1 Operation	9.2	5.4	2.6	0.93
Phase 2 Total	**32**	**38**	**4.2**	**2.4**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 3 Construction	19	10	0.21	0.20
Phases 1 and 2 Operation	53	37	21	7.1
Phase 3 Total	**72**	**47**	**21**	**7.1**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	No	No	No
Phase 4 Construction	23	11	0.25	0.24
Phases 1, 2, and 3 Operation	93	57	42	14
Phase 4 Total	**116**	**68**	**42**	**14**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
Phase 5 Construction	11	7.4	0.16	0.15
Phases 1, 2, 3, and 4 Operation	141	83	69	22
Phase 5 Total	**152**	**90**	**69**	**22**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No

Table 4.G.8 Continued

	Maximum Annual Emissions (ton/year)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction[a]	**4.6**	**8.2**	**0.34**	**0.32**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1) [a]	4.6	5.0	0.23	0.22
Phase 1 Operation	1.7	1.0	0.48	0.17
Phase 2 Total	**6.3**	**6.0**	**0.71**	**0.39**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 3 Construction	4.9	1.4	0.03	0.03
Phases 1 and 2 Operation	10	6.7	3.9	1.34
Phase 3 Total	**15**	**8.1**	**3.9**	**1.3**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	No	No	No
Phase 4 Construction	6.0	1.7	0.04	0.04
Phases 1, 2, and 3 Operation	17	10	7.7	2.5
Phase 4 Total	**23**	**12**	**7.7**	**2.5**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No
Phase 5 Construction	2.7	1.1	0.02	0.02
Phases 1, 2, 3, and 4 Operation	26	15	13	4.0
Phase 5 Total	**29**	**16**	**13**	**4.0**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No

Notes: Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold, then the exceedance is identified by a bolded "Yes" response.

For each construction phase, annual emissions are divided over the number of construction days for the given phase, to determine the average daily emissions. Phases 1 and 2 would be constructed concurrently. Phase durations as estimated by the applicant were 780 days for all phases except Phase 1 which would be less intensive. Phase 1 duration estimated using CalEEMod default values as these data were not available.

No mitigation is required until Phase 3 of construction. Consequently construction emissions for Phase 1 and Phase 2 are unmitigated.

Source: ESA, 2016

Table 4.G.9: Mitigated Average Daily and Maximum Annual Emissions for the Maximum Commercial Scenario During Construction

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction[a]	**24**	**42**	**1.9**	**1.8**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1) [a]	25	34	1.6	1.5
Phase 1 Operation	9.2	5.4	2.6	0.93
Phase 2 Total	**34**	**40**	**4.2**	**2.6**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 3 Construction	19	11	0.22	0.21
Phases 1 and 2 Operation	63	43	27	8.8
Phase 3 Total	**82**	**54**	**27**	**9.0**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	No	No	No
Phase 4 Construction	19	10	0.24	0.23
Phases 1, 2, and 3 Operation	103	64	49	16
Phase 4 Total	**122**	**74**	**49**	**16**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
Phase 5 Construction	8.2	7.5	0.15	0.15
Phases 1, 2, 3, and 4 Operation	144	81	74	23
Phase 5 Total	**152**	**89**	**75**	**23**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No

Table 4.G.9 Continued

	Maximum Annual Emissions (ton/year)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phases 1 and 2 Construction	**4.7**	**1.8**	**0.03**	**0.03**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 2 Construction (Post-Phase 1)	5.0	5.2	0.24	0.23
Phase 1 Operation	1.7	1.0	0.48	0.17
Phase 2 Total	**6.7**	**6.2**	**0.72**	**0.40**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No
Phase 3 Construction	4.8	1.5	0.03	0.03
Phases 1 and 2 Operation	11	7.9	5.0	1.6
Phase 3 Total	**16**	**9.4**	**5.0**	**1.6**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	No	No	No
Phase 4 Construction	5.0	1.5	0.04	0.03
Phases 1, 2, and 3 Operation	19	12	9.0	2.9
Phase 4 Total	**24**	**14**	**9.0**	**2.9**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No
Phase 5 Construction	2.1	1.1	0.02	0.02
Phases 1, 2, 3, and 4 Operation	26	15	14	4.2
Phase 5 Total	**28**	**16**	**14**	**4.2**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No

Notes: Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold then the exceedance is identified by a bolded "Yes" response.

For each construction phase, annual emissions are divided over the number of construction days for the given phase, to determine the average daily emissions. Phases 1 and 2 would be constructed concurrently. Phase durations as estimated by the applicant were 780 days for all phases except Phase 1 which would be less intensive. Phase 1 duration estimated using CalEEMod default values as these data were not available

No mitigation is required until Phase 3 of construction. Consequently construction emissions for Phase 1 and Phase 2 are unmitigated.

Source: ESA, 2016

Impact AQ-2: At project build-out, the Proposed Project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants. (*Significant and Unavoidable with Mitigation*)

Operational emissions at project build-out were quantified consistent with the methodology identified above for Impact AQ-1 for build-out year 2030. The operational emissions at project build-out for the Maximum Residential and Maximum Commercial Scenarios are discussed below.

Maximum Residential Scenario

The daily and annual increase in emissions associated with operation of the Maximum Residential Scenario in the assumed build-out year of 2030 is summarized in Table 4.G.10: Unmitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Residential Scenario, for ROG (precursor of ozone), NOx (precursor of ozone), PM_{10}, and $PM_{2.5}$. Project-related emissions under the Maximum Residential Scenario would exceed BAAQMD thresholds of significance for ROG, NOx, and PM_{10}. ROG emissions would be primarily from mobile emissions (54 percent) and area sources (43 percent). The area source emission component is primarily attributable to consumer product use of building occupants (77 percent) and maintenance application of paints and other architectural coatings (18 percent). NOx emissions would be primarily from mobile sources and energy demand, while PM_{10} emissions are almost entirely mobile source related.

Therefore, the Proposed Project would have a significant impact on regional emissions related to operational emissions of ozone precursors and PM_{10}. Significant emissions of ozone precursors (ROG and NOx) and PM_{10} from operation would have the same potential health effects as discussed in Impact AQ-1 above.

Maximum Commercial Scenario

The daily and annual increase in emissions associated with operation of the Maximum Commercial Scenario is shown in Table 4.G.11: Unmitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Commercial Scenario, for ROG, NOx, PM_{10}, and $PM_{2.5}$. Project-related emissions under the Maximum Commercial Scenario would exceed BAAQMD thresholds of significance for ROG, NOx, and PM_{10}. Therefore, the Proposed Project would also have a significant impact on regional emissions related to ozone precursors and PM_{10} under this scenario. Significant emissions of ozone precursors (ROG and NOx) and PM_{10} from operation would have the same potential health effects as discussed in Impact AQ-1 above.

Table 4.G.10: Unmitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Residential Scenario

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Area Source	81.6	1.4	0.7	0.7
Energy	2.6	23.0	1.8	1.8
Mobile	89.9	67.8	86.6	24.7
Stationary Source (generator)	1.5	18.7	1.3	1.3
Total	**176**	**111**	**90**	**29**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	**Yes**	No
	Maximum Annual Emissions (ton/year)			
Area Source	14.9	0.26	0.13	0.13
Energy	0.48	4.2	0.33	0.33
Mobile	16.4	12.4	15.8	4.5
Stationary Source (generator)	0.28	3.4	0.24	0.24
Total	**32**	**20**	**17**	**5.2**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	**Yes**	No

Note: Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold, then the exceedance is identified by a bolded "Yes" response.

Source: ESA, 2016

Table 4.G.11: Unmitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Commercial Scenario

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Area Source	78.4	0.8	0.4	0.4
Energy	2.4	21.4	1.6	1.6
Mobile	98.1	74.5	96.4	28.5
Stationary Source (generator)	1.5	18.7	0.2	0.02
Total	**180**	**115**	**99**	**31**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	**Yes**	No
	Maximum Annual Emissions (ton/year)			
Area Source	14.3	0.14	0.07	0.07
Energy	0.44	3.9	0.30	0.30
Mobile	17.9	13.6	17.6	5.2
Stationary Source (generator)	0.28	3.4	0.24	0.24
Total	**32**	**21**	**18**	**5.8**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	**Yes**	No

Note: Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold, then the exceedance is identified by a bolded "Yes" response.

Source: ESA, 2016

Mitigation Measures M-AQ-1b though M-AQ1g would reduce operational emissions associated with both the Maximum Residential and Maximum Commercial Scenarios. As indicated in Table 4.G.12: Mitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Residential Scenario, and Table 4.G.13: Mitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Commercial Scenario, even with implementation of Mitigation Measures M-AQ-1b through M-AQ-1g, criteria pollutant emissions from operation of the Maximum Residential Scenario or the Maximum Commercial Scenario would remain significant. Consequently, implementation of Mitigation Measure M-AQ-1h: Offsets of Operational Emissions would be required to reduce emission to the extent feasible.

Table 4.G.12: Mitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Residential Scenario

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Area Source	75.1	1.4	0.7	0.7
Energy	2.6	23.0	1.8	1.8
Mobile	76.2	57.5	74.5	21.9
Stationary Source (generator)	0.2	2.0	0.02	0.02
Total	**154**	**84**	**77**	**22**
Significance Threshold	**54**	**54**	**82**	**54**
Above Threshold?	**Yes**	**Yes**	No	No
	Maximum Annual Emissions (ton/year)			
Area Source	13.7	0.26	0.13	0.13
Energy	0.48	4.2	0.33	0.33
Mobile	13.9	10.5	13.6	4.0
Stationary Source (generator)	0.03	0.4	<0.01	<0.01
Total	**28**	**15**	**14**	**4.5**
Significance Threshold	**10**	**10**	**15**	**10**
Above Threshold?	**Yes**	**Yes**	No	No

Source: ESA, 2016

Table 4.G.13: Mitigated Average Daily and Maximum Annual Operational Emissions at Project Build-out for the Maximum Commercial Scenario

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Area Source	72.3	0.8	0.4	0.4
Energy	2.4	21.4	1.6	1.6
Mobile	82.2	62.5	81.1	24.1
Stationary Source (generator)	0.2	2.0	<0.01	<0.01
Total	**157**	**87**	**84**	**26**
Significance Threshold	**54**	**54**	**82**	**54**
Above Threshold?	**Yes**	**Yes**	**Yes**	**No**
	Maximum Annual Emissions (ton/year)			
Area Source	13.2	0.14	0.07	0.07
Energy	0.44	3.9	0.30	0.30
Mobile	15.0	11.4	14.8	4.4
Stationary Source (generator)	0.03	0.4	<0.01	<0.01
Total	**29**	**16**	**15**	**5**
Significance Threshold	**10**	**10**	**15**	**10**
Above Threshold?	**Yes**	**Yes**	**Yes**	No

Source: ESA, 2016

As discussed in Impact AQ-1, if Mitigation Measure M-AQ-1h is implemented via a directly funded or implemented offset project, it could have the potential to reduce the impact to a less than significant level but only if the timing of the offsets could be documented prior to the occupancy of Phase 3 and ensured for the life of the project. Therefore, the residual impact of project emissions during operation at build out is conservatively considered significant and unavoidable with mitigation, acknowledging the assumption that the project sponsor would implement Mitigation Measures M-AQ-1a though M-AQ-1h (Emission Offsets).

Impact AQ-3: Construction and operation of the Proposed Project would generate toxic air contaminants, including DPM, which would expose sensitive receptors to substantial pollutant concentrations. (*Less than Significant with Mitigation*)

Site preparation activities, such as demolition, excavation, grading, foundation construction, and other ground-disturbing construction activity, would affect localized air quality during the construction phases of the Proposed Project. Short-term emissions from construction equipment during these site preparation activities would include directly emitted PM ($PM_{2.5}$ and PM_{10}) and TACs such as DPM. Additionally, the long-term emissions from the project's mobile and

stationary sources, as described in Impact AQ-1, would include PM ($PM_{2.5}$) and TACs such as DPM and some compounds or variations of ROGs. The generation of these short- and long-term emissions could expose sensitive receptors to substantial pollutant concentrations of TACs, resulting in a localized health risk. Therefore, an HRA was conducted for the Proposed Project.

Neither the proposed receptors nor the nearest off-site receptors are located within an area that currently meets the APEZ criteria (100 in one million excess cancer risk or a $PM_{2.5}$ concentration of 10 $\mu g/m^3$). For receptors not located in areas that meet the APEZ criteria, an HRA is conducted to determine whether the Proposed Project would, in combination with other exiting sources in the area, result in a given off-site or on-site receptor meeting the APEZ criteria. If a receptor point meets the APEZ criteria, that otherwise would not without the project, a project would result in a significant health risk impact if the project would contribute to $PM_{2.5}$ concentrations above 0.3 $\mu g/m^3$ or result in an excess cancer risk greater than 10.0 per one million persons exposed.

Methodology

An HRA is used to determine if a particular chemical poses a significant risk to human health and, if so, under what circumstances. The HRA prepared for this project focuses on $PM_{2.5}$ and TACs because these, more so than other types of air pollutants, pose significant health impacts at the local level[63]. The methodologies for the TAC analysis were based on the most recent BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards,[64] which recommends the use of the EPA's AERMOD model.

The health risk estimated DPM, speciated[65] total organic gas (TOG), and $PM_{2.5}$ concentrations based on data generated by the CalEEMod model for construction and operational project vehicle traffic. Operational contributions from emergency standby generators were based on calculations using emission rates published by EPA25F.[66] DPM, TOG, and $PM_{2.5}$ emissions rates were used as inputs into AERMOD to predict worst case DPM, TOG, and $PM_{2.5}$ concentrations, respectively. AERMOD is also the model that was used by BAAQMD in the citywide modeling discussed in the Setting section. DPM and speciated TOG concentrations were then used to determine excess lifetime cancer risk based on the health risk assessment methodology published

[63] Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2011, p. 4-21.

[64] BAAQMD, *Recommended Methods for Screening and Modeling Local Risks and Hazards,* May 2012. Available online at http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20Modeling%20Approach.ashx. Accessed January 18, 2016.

[65] Only certain compounds, or species, of total organic gases are also TACs.

[66] U.S. EPA AP-42, Compilation of Air Pollutant Emission Factors. 3.3 Gasoline and Diesel Industrial Engines & 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines, October 1996.

by the OEHHA in 2015. Construction activities were modeled as area sources, haul trips and operational trips as adjacent volume sources, and operational generators as point sources[67].

The DPM and $PM_{2.5}$ concentrations for each phase of construction due to construction activities and haul trips were modeled separately by year of construction, to account for emissions specific to construction activities occurring in specific time periods. Operational on-road traffic and emergency generator emissions were also modeled to determine pollutant concentrations at on- and off-site receptors. The excess cancer risk and $PM_{2.5}$ concentrations from all sources (ambient [for $PM_{2.5}$ only] plus project construction, operation, and traffic sources) as well as the excess cancer risk from the sum of all existing emissions sources for each receptor point was then determined.

Near-field air dispersion modeling of DPM from project sources was conducted using the EPA's AERMOD model (version 15181).[68] This model requires inputs such as source parameters, meteorological parameters, topography information, and receptor parameters. The exposure parameters were obtained using risk assessment guidelines from the California Environmental Protection Agency[69] and BAAQMD[70]. Exposure parameters include daily breathing rate, exposure time, exposure frequency, exposure duration, average time, and inhalation intake factors. Details of the AERMOD modeling inputs, toxics analysis, and exposure parameters are included in the AQTR.

Off-site child residents (living adjacent to the project site and not within any of the project's phases) were assumed to be present at one location during the entire construction period and were evaluated for both project scenarios. Off-site and on-site residents were assumed to be present at one location for 30 years, consistent with OEHHA guidance.

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[67] In dispersion modeling, a point source is a source emanated from a discrete point on the modeling grid. An area source is a two-dimensional emissions source that is represented by polygon vertices. A volume source is a three-dimensional emissions source that is represented by a location, release height, and initial lateral and vertical plume sizes.

[68] On November 9, 2005, the EPA promulgated final revisions to the Federal Guideline on Air Quality Models, in which it recommended that AERMOD be used for dispersion modeling evaluations of criteria air pollutant and toxic air pollutant emissions from typical industrial facilities. EPA Preferred/Recommended Models, *AERMOD Modeling System*, http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod.

[69] California Environmental Protection Agency, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment, February 2015*. Available online at http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf. Accessed January 18, 2016.

[70] BAAQMD, *Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines*, January 2010. Available online at http://www.baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx. Accessed January 18, 2016.

$PM_{2.5}$ concentrations are evaluated on an annual average basis. However, excess cancer risk is evaluated based on lifetime exposure to pollutant concentrations; therefore, the AQTR evaluated excess cancer risk as a result of exposure to both construction and operational emission together. Both the Maximum Commercial and Maximum Residential Scenarios were evaluated and the higher result for each receptor type was determined.

Excess Cancer Risk from Construction and Operation Emissions at Off-Site Receptors. The maximum estimated excess lifetime cancer risk from all project sources (assuming a receptor was born during construction and exposed to project-related emissions for 30 years) at off-site locations is presented in Table 4.G.14 for the Maximum Residential Scenario and Table 4.G.15 for the Maximum Commercial Scenario. As shown in the tables, unmitigated emissions plus existing background emissions would not result in a total excess cancer risk of 100 in one million at the most impacted receptor. This would be below the level for causing a new location to meet the APEZ excess cancer risk criteria, and thus would be a less-than-significant impact. The majority of project-generated excess cancer risk at the Maximum Exposed Individual Sensitive Receptor (MEISR) would be attributable to construction emissions.

Excess Cancer Risk from Construction and Operational Emissions at On-Site Receptors. Both the Maximum Residential Scenario and the Maximum Commercial Scenario would include development of residential units, which is considered a sensitive land use for purposes of air quality evaluation. The Proposed Project would result in construction-related TAC emissions that would affect the occupants of the first phases of the Proposed Project and diesel backup generators may also impact these future residents. The estimated excess cancer risk from the emissions of both scenarios at the on-site MEISR are presented in Table 4.G.16: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions at the Maximally Impacted On-Site Receptors. The project's emissions would combine with existing background concentrations and would exceed the APEZ excess cancer risk criteria of an excess cancer risk of 100 per one million persons exposed. Therefore, the impact with regard to increased cancer risk would be *significant* for on-site receptors for the Maximum Residential and Maximum Commercial Scenarios.

The mitigated condition assumed in the HRA included emission reductions quantified for Mitigation Measures M-AQ-1a: Construction Emissions Minimization, M-AQ-1b: Diesel Backup Generator Specifications, M-AQ-1c: Use Low- and Super-Compliant VOC Architectural Coatings in Maintaining Buildings through CC&Rs, and M-AQ-1f: Transportation Demand Management. As indicated in Tables 4.G.15 and 4.G.16, construction emissions contribute over 90 percent of the unmitigated project's health risk. Consequently, implementation of Mitigation Measure M-AQ-1a alone would be sufficient to reduce this impact to a less than significant level.

Table 4.G.14: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Maximum Residential Scenario at Off-Site Receptors

Source	Lifetime Excess Cancer Risk (in one million)		$PM_{2.5}$ Concentration ($\mu g/m^3$)	
	Unmitigated	**Mitigated**	**Unmitigated**	**Mitigated**
Residential Receptor				
Background	44	44	8.4	8.4
Construction – Off-road Emissions	15	14	0.072	0.072
Construction – Vehicle Traffic	0.12	0.12	3.0E-04	3.0E-04
Operation – Emergency Generators	0.74	0.074	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.65	0.55	0.024	0.020
Cumulative Total	**60**	**58**	**8.5**	**8.5**
APEZ Criteria	100	100	10.0	10.0
Significant?	No	No	No	No
School Receptor – Construction				
Background	44	44	8.4	8.4
Construction – Off-road Emissions	4.8	3.4	0.072	0.072
Construction – Vehicle Traffic	0.07	0.069	3.0E-04	3.0E-04
Cumulative Construction Total	**49**	**47**	**8.5**	**8.5**
APEZ Criteria	100	100	10.0	10.0
Significant?	No	No	No	No
School Receptor – Operation				
Background	44	44	8.4	8.4
Operation – Emergency Generators	0.14	0.014	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.12	0.11	0.024	0.020
Cumulative Operational Total	44	**44**	**8.4**	**8.4**
Cumulative Total (construction and operation)	49	**47**	**8.5**	**8.5**
APEZ Criteria	100	100	10.0	10.0
Significant?	No	No	No	No

Source: Ramboll ENVIRON, 2016

Table 4.G.15: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Maximum Commercial Scenario at Off-Site Receptors

Source	Lifetime Excess Cancer Risk (in one million)		$PM_{2.5}$ Concentration ($\mu g/m^3$)	
	Unmitigated	**Mitigated**	**Unmitigated**	**Mitigated**
Residential Receptor				
Background	51	51	8.4	8.4
Construction – Off-road Emissions	16	14	0.073	0.073
Construction – Vehicle Traffic	0.47	0.47	3.0E-04	3.0E-04
Operation – Emergency Generators	0.73	0.073	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.44	0.37	0.024	0.020
Cumulative Total	**68**	**66**	**8.5**	**8.5**
APEZ	100	100	10.0	10.0
Significant?	No	No	No	No
School Receptor – Construction				
Background	44	44	8.4	8.4
Construction – Off-road Emissions	4.7	3.5	0.073	0.073
Construction – Vehicle Traffic	0.07	0.07	3.0E-04	3.0E-04
Cumulative Total	**49**	**47**	**8.5**	**8.5**
APEZ Criteria	100	100	10.0	10.0
Significant?	No	No	No	No
School Receptor – Operation				
Background	44	44	8.4	8.4
Operation – Emergency Generators	0.14	0.014	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.123	0.104	0.024	0.020
Cumulative Total	**44**	**44**	**8.5**	**8.5**
Cumulative Total (construction and operation)	49	**48**	**8.5**	**8.5**
APEZ Criteria	100	100	10.0	10.0
Significant?	No	No	No	No

Source: Ramboll ENVIRON, 2016

Table 4.G.16: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions at the Maximally Impacted On-Site Receptors

Source	Lifetime Excess Cancer Risk (in one million)		$PM_{2.5}$ Concentration ($\mu g/m^3$)	
	Unmitigated	**Mitigated[a]**	**Unmitigated**	**Mitigated**
Maximum Residential Scenario				
Background	36	34	8.3	8.4
Construction – Off-road Emissions	81	20	0.24	0.058
Construction – Vehicle Traffic	0.30	0.17	1.1E-04	3.1E-04
Operation – Emergency Generators	2.9	0.13	0.0065	1.7E-04
Operation – Vehicle Traffic	0.19	0.31	0.0027	0.011
Total	**120**	**54**	**8.6**	**8.4**
City of SF Threshold (not in APEZ)	100	100	10.0	10.0
Significant?	**Yes**	No	No	No
Maximum Commercial Scenario				
Background	27	35	8.3	8.4
Construction – Off-road Emissions	78	51	0.24	0.15
Construction – Vehicle Traffic	0.043	0.20	1.0E-04	4.0E-04
Operation – Emergency Generators	4.9	0.11	0.0065	1.5E-04
Operation – Vehicle Traffic	0.073	0.38	0.0027	0.014
Total	**110**	**86**	**8.6**	**8.6**
City of SF Threshold (not in APEZ)	100	100	10.0	10.0
Significant?	**Yes**	No	No	No

Note:

[a] In some instances the mitigated value may be greater than the non-mitigated value. This can occur when application of mitigation changes the location of the maximally impacted receptor, thereby potentially resulting in a reported value for a given receptor that is different and potentially greater than that of the previous maximally impacted receptor under the non-mitigated condition.

Source: Ramboll ENVIRON, 2016

$PM_{2.5}$ Concentrations from Construction and Operation Emissions at Off-Site Receptors. The maximum estimated $PM_{2.5}$ concentrations from all project sources at off-site locations are presented in Table 4.G.14 for the Maximum Residential Scenario and in Table 4.G.15 for the Maximum Commercial Scenario. As shown in the tables, unmitigated emissions in combination with background concentrations would result in $PM_{2.5}$ concentrations of 8.5 $\mu g/m^3$ for both scenarios, which would be below the levels for causing a new location to meet the APEZ criteria of 10 $\mu g/m^3$. Therefore, this would be a less than significant impact.

$PM_{2.5}$ Concentrations from Construction and Operation Emissions at On-Site Receptors. The maximum estimated $PM_{2.5}$ concentrations from all project sources at on-site locations are presented in Table 4.G.16. As shown in the table, unmitigated emissions in combination with background concentrations would result in $PM_{2.5}$ concentrations of 8.6 $\mu g/m^3$ for both scenarios, which would be below the levels for causing a new location to meet the APEZ criteria of 10 $\mu g/m^3$. Therefore, this would be a less than significant impact.

In summary, the Proposed Project would result in significant health risk impact to on-site sensitive receptors under both the Maximum Residential and Maximum Commercial Scenarios. This impact would be reduced to less than significant with incorporation of Mitigation Measure M-AQ-1a.

Impact AQ-4: The Maximum Residential or Maximum Commercial Scenarios would conflict with implementation of the Bay Area 2010 Clean Air Plan. (*Less than Significant with Mitigation*)

The most recently adopted air quality plan for the SFBAAB is the 2010 Clean Air Plan. Although an updated Clean Air Plan is currently being prepared, it is still not finalized and subject to change based on pending public comments. The Clean Air Plan is a road map that demonstrates how the Bay Area will, in accordance with the requirements of the California Clean Air Act, implement all feasible measures to reduce ozone. It also provides a control strategy to reduce ozone, PM, air toxics, and GHGs. In determining consistency with the Clean Air Plan, this analysis considers whether the project would (1) support the primary goals of the Clean Air Plan, (2) include applicable control measures from the Clean Air Plan, and (3) avoid disrupting or hindering implementation of control measures identified in the Clean Air Plan.

The primary goals of the Clean Air Plan are to (1) reduce emissions and decrease concentrations of harmful pollutants, (2) safeguard the public health by reducing exposure to air pollutants that pose the greatest health risk, and (3) reduce GHG emissions. To meet the primary goals, the Clean Air Plan recommends specific control measures and actions. These control measures are grouped into various categories and include stationary- and area-source measures, mobile-source measures, transportation control measures, land-use measures, and energy and climate measures.

The Clean Air Plan recognizes that, to a great extent, community design[71] dictates individual travel modes and that a key long-term control strategy to reduce emissions of criteria pollutants, air toxics, and GHGs from motor vehicles is to channel future Bay Area growth into communities where goods and services are located nearby and people have a range of viable transportation options. To this end, the Clean Air Plan includes 55 control measures aimed at reducing air pollutants in the SFBAAB. Many of these measures address stationary sources and will be implemented by BAAQMD using its permit authority and therefore are not suited to implementation through local planning efforts or project approval actions. The applicable 25 CAP measures are identified in Table 4.G.17: Control Strategies of the 2010 Clean Air Plan. This table identifies each control strategy and correlates it to specific elements of each of the two project scenarios or explains why the strategy does or does not apply to the project site development. As shown in Table 4.G.17, without certain mitigation measures incorporated into the project, the project would not include applicable control measures from the 2010 Clean Air Plan and this impact would be *significant*. However, with incorporation of mitigation measures identified in Table 4.G.17, the Proposed Project would include applicable control strategies contained in the 2010 Clean Air Plan for the SFBAAB.

The Proposed Project's impact with respect to GHGs is discussed in Section 4.H, Greenhouse Gas Emissions. As stated there, the Proposed Project would be substantially compliant with the City's Greenhouse Gas Reduction Strategy and thus would not result in any significant impacts associated with an increase in GHGs or conflict with measures adopted for the purpose of reducing such emissions.

In addition to the above measures, transportation control measures that are identified in the Clean Air Plan are implemented by the *San Francisco General Plan* and the Planning Code, for example, through the City's Transit First Policy, the bicycle parking requirements, and transit impact development fees. Additionally, the project would incorporate a TDM program identified as Mitigation Measure M-AQ-1f. As indicated in Table 4.G.17, implementation of the TDM Program under Mitigation Measure M-AQ-1f and the additional Mitigation Measure M-AQ-1g (Additional Mobile Source Control Measures [preferential parking and/or charging stations for

[71] For people who live (and/or work) in low-density, car-oriented developments, the motor vehicle is often the only viable transportation option. In such situations, even the most robust strategy to promote alternative modes of travel can have, at best, only a very modest effect. In contrast, compact communities with a mixture of land uses make it much easier to walk, cycle, or take transit for at least some daily trips.

Table 4.G.17: Control Strategies of the 2010 Clean Air Plan

2010 Clean Air Plan Control Strategy	Elements of Proposed Project Site Development Consistent with the Strategy or Explanation of Non-Applicability
Transportation Control Measures	
TCM A: Improve Transit Services	As stated in Mitigation Measure M-TR-4: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed, the project sponsors would be required by the Planning Department to perform and submit trip generation calculations or monitoring surveys to demonstrate if and when the Proposed Project will cause capacity on the 48 Quintara/24th Street Muni route to exceed 85 percent and if so shall provide capital costs for increased capacity on the route. Although the San Francisco Municipal Transportation Agency has not formally agreed to operate increased service on this route, this measure provides for transit improvement should the San Franciso Municipal Transportation Agency acknowledge that it is warranted.
TCM B: Improve System Efficiency	Not Applicable: This measure addresses infrastructure improvements to increase operational efficiencies on freeways and transit service (such as common fare payment systems) that are geared toward regional transit agencies and Caltrans, and not by local government or through land use development projects.
TCM C: Encourage Sustainable Travel Behavior (i.e., voluntary employer-based trip reduction program)	Mitigation Measure M-AQ-1f would require the project sponsors to establish a TDM program. Developers may choose from a menu of TDM strategies including subsidies for site users who use transit or other alternative modes of transportation.
TCM D: Support Focused Growth (Bicycle and Pedestrian friendliness)	The Proposed Project includes bike lanes and bike-parking facilities to promote bicycling in and around the project site. Under the provisions of the SUD, bike amenities would be constructed on the project site to meet or exceed Planning Code requirements. Improvements proposed by the Proposed Project include construction of Class 2 bicycle facilities and Class 3 bicycle facilities (shared-lane markings and signage) on 20th Street, 22nd Street, and Maryland Street, and a Class 1 separated bicycle and pedestrian facility would be provided to extend the Bay Trail and Blue Greenway the length of the project site along the shoreline.
TCM E: Implement Pricing Strategies	As discussed in the project description, all residential parking would be unbundled, which means parking would be an optional, additional cost to the price of renting or purchasing a dwelling unit. Additionally, parking strategies would be included as part of the Proposed Project's TDM program.
Mobile Source Control Measures	
MSM A-1: Promote Clean Fuel Efficient Vehicles	Not part of Proposed Project site development. Mitigation Measure M-AQ-1g would increase the requirement for the project sponsors to provide preferential parking for alternative-fueled vehicles above that required by the Planning Code.

Table 4.G.17 Continued

2010 Clean Air Plan Control Strategy	Elements of Proposed Project Site Development Consistent with the Strategy or Explanation of Non-Applicability
MSM A-2: Zero Emission Vehicles	Not part of Proposed Project site development. Mitigation Measure M-AQ-1g requires the project sponsor to provide neighborhood electric vehicle programs to reduce the need to have a car or second car.
MSM A-3: Green Fleets	Development of the project site generally would be retail, commercial, or residential in nature and unlikely to accommodate a land use requiring a fleet of vehicles. However, it is possible that the project could implement replacement or repair of high-emitting vehicle fleet as part of Mitigation Measure M-AQ-1h (Emissions Offsets).
MSM A-4: Replacement or Repair of High-Emitting Vehicles	The project is a development project whose vehicle emissions would be generated by residents and commercial tenants who own their own vehicles. However, it is possible that the project could implement replacement or repair of high-emitting vehicles as part of Mitigation Measure M-AQ-1h (Emissions Offsets).
MSM B-1: Fleet Modernization for Medium and Heavy-Duty Trucks	The project is a development project whose vehicle emissions would be generated by residents and commercial tenants who own their own vehicles. However, it is possible that the project could implement replacement or repair of high-emitting vehicles as part of Mitigation Measure M-AQ-1h (Emissions Offsets).
MSM B-2: Low NOx Retrofits in Heavy-Duty Trucks	Construction of the Proposed Project would be subject to Mitigation Measure M-AQ-1a, which would require low NOx-emitting construction vehicles. Regarding operational emissions, the project is a development project whose vehicle emissions would be generated by residents and commercial tenants who own their own vehicles. However, it is possible that the project could implement replacement or repair of high-emitting vehicles as part of Mitigation Measure M-AQ-1h (Emissions Offsets).
MSM B-3: Efficient Drive Trains	Not Applicable: This strategy addresses development and demonstration programs in partnership with the CARB and the California Energy Commission.
MSM C-1: Construction and Farming Equipment	Construction of the Proposed Project would be subject to Mitigation Measure M-AQ-1a, which would require Tier 4, low-emissions construction vehicles. With regards to operational emissions, the project is a development project whose vehicle emissions would be generated by residents and commercial tenants who own their own vehicles. However, it is possible that the project could implement replacement or repair of high-emitting vehicles as part of Mitigation Measure M-AQ-1h (Emissions Offsets).
MSM C-2: Lawn & Garden Equipment	This strategy addresses voluntary exchange programs implemented by BAAQMD. This measure could be one of the measures implemented by previously identified Mitigation Measure M-AQ-1h (Emissions Offsets).

Table 4.G.17 Continued

2010 Clean Air Plan Control Strategy	Elements of Proposed Project Site Development Consistent with the Strategy or Explanation of Non-Applicability
MSM C-3: Recreational Vessels	This strategy addresses voluntary exchange programs implemented by BAAQMD. This measure could be one of the measures implemented by previously identified Mitigation Measure M-AQ-1h (Emissions Offsets).
Land Use and Local Impact Measures	
LUM 1: Goods Movement	Development of the project site generally would be retail, commercial or residential in nature and would not include warehousing and industrial uses that would involve substantial goods transport.
LUM 2: Indirect Source Review Rule	Not Applicable: This strategy addresses implementation of an indirect source rule by BAAQMD.
LUM 3: Updated CEQA Guidelines	Not Applicable: This strategy addresses updating of the *CEQA Guidelines* by BAAQMD. These guidelines were most recently updated in May 2012, and were one of many tools used in the assessment of air quality impacts.
LUM 4: Land Use Guidance	Not Applicable: This strategy addresses updating land use planning documents such as the proposed development scenarios and demonstrating consistency with air quality protection guidance such as the BAAQMD *CEQA Guidelines* that are applied in this analysis.
LUM 5: Reduce Health Risk in Impacted Communities	The Proposed Project site is identified in Figure 3-2 of the CAP as an "impacted community." This EIR evaluates the health risk effects of the project in combination with existing background health risks in Impact AQ-3 and determines that with incorporation of Mitigation Measure M-AQ1a, the Proposed Project would not result in a significant health risk impact.
LUM 6: Enhanced Air Quality Monitoring	Not Applicable: This strategy addresses air quality monitoring that is under the purview of BAAQMD and/or the CARB.
Energy and Climate Measures	
ECM 1: Energy Efficiency	The Proposed Project would comply with San Francisco Green Building Requirements for energy efficiency in new buildings. Energy-efficient appliances and energy-efficient lighting would also be installed in the three rehabilitated historic buildings.
ECM 2: Renewable Energy	The Proposed Project is required to meet San Francisco Green Building Requirements for renewable energy. As discussed in Section 4.H Greenhous Gas Emissions, at least 15 percent of the roof area of all proposed buildings (excluding existing Buildings 2, 12, and 21) would include roof-mounted or building-integrated solar photovoltaic (PV) systems and/or roof-mounted solar thermal hot water systems.

Table 4.G.17 Continued

2010 Clean Air Plan Control Strategy	Elements of Proposed Project Site Development Consistent with the Strategy or Explanation of Non-Applicability
ECM 3: Urban Heat Island Mitigation	The Proposed Project development includes provision of a substantial amount of open space. This open space, as currently proposed, along with the landscaping requirements that would be imposed for site-specific development projects within the project site would implement measure ECM-3.
ECM 4: Shade Tree Planting	No street trees would be removed, and new street trees would be planted along designated street segments, for a total of approximately 152 street trees. Street trees would be planted in accordance with Public Works Code Section 806(d), except for areas around the Historic Core, where Federal historic standards would be applied.

Source: ESA, 2016

fuel-efficient vehicles and a neighborhood electric vehicle program]) would ensure the project includes relevant transportation control measures specified in the Clean Air Plan. Therefore, the Proposed Project would include applicable control measures identified in the Clean Air Plan and would support the primary goals of the Clean Air Plan.

Examples of a project that could cause the disruption or delay of Clean Air Plan control measures are projects that would preclude the extension of a transit line or bike path, or projects that propose excessive parking beyond City parking requirements. The Proposed Project site is a dense, walkable urban area near a concentration of regional and local transit service which include a Muni light rail stop at Third and 20th streets, 500 feet from the project site, and a Caltrain stop at 22nd Street, less than 0.5 mile from the project site. The Proposed Project site is designated as a Priority Development Area pursuant to the *Plan Pay Area.* This designation applies to new development areas that would support the day-to-day needs of residents and workers in a pedestrian-friendly environment served by transit. The Proposed Project includes bike lanes, bike-safety-oriented street design, and bike-parking facilities to promote bicycling in and around the project site.

The Proposed Project would not preclude the extension of a transit line or a bike path or any other transit improvement and, thus, would not disrupt or hinder implementation of control measures identified in the Clean Air Plan.

The City's Planning Code does not have parking minimum or maximum requirements for the existing Heavy Industrial zoning designation. However, the Pier 70 SUD would establish parking maximums of no more than 0.75 parking space per residential dwelling unit and no more than one parking space per 1,000 square feet of gross floor area for the office, commercial, retail, arts, or light industrial uses resulting in a maximum of over 4,000 spaces for both scenarios. Under the

Maximum Residential Scenario, about 3,370 off-street parking spaces and 285 on-street parking spaces would be allowed. Under the Maximum Commercial Scenario, about 3,496 off-street and 285 on-street parking spaces would be allowed. Consequently, the Proposed Project does not propose excessive parking beyond City parking requirements.

For the reasons described above, the Proposed Project would not interfere with implementation of the Clean Air Plan, and because the Proposed Project would be consistent with the applicable air quality plan that demonstrates how the region will improve ambient air quality and achieve the State and Federal ambient air quality standards, this impact would be less than significant.

Impact AQ-5: The Maximum Residential or Maximum Commercial Scenarios would not create objectionable odors that would affect a substantial number of people. (*Less than Significant*)

During construction, the various diesel-powered vehicles and equipment in use on site would create localized odors. These odors would be temporary and depend on specific construction activities occurring at certain times and are not likely to be noticeable for extended periods of time beyond the project site. Therefore, the potential for diesel odor impacts is considered less than significant. Existing uses on the project site are entirely for storage and auto space and are not an existing odor source.

Although there may be some potential for small-scale, localized odor issues to emerge around project sources such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site and off-site sensitive receptors would be unlikely. BAAQMD Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds and applies to restaurants that employ more than five persons. Therefore, odor impacts would be less than significant.

CUMULATIVE IMPACTS

This section discusses the cumulative impacts to air quality that could result from the Proposed Project in conjunction with past, present, and reasonably foreseeable future projects.

Impact C-AQ-1: The Maximum Residential or Maximum Commercial Scenarios, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative regional air quality impacts. (*Significant and Unavoidable with Mitigation*)

The contribution of a project's individual air emissions to regional air quality impacts is, by its nature, a cumulative effect. Emissions from past, present, and future projects in the region also have or will contribute to adverse regional air quality impacts on a cumulative basis. No single project by itself would be sufficient in size to result in non-attainment of ambient air quality

standards. Instead, a project's individual emissions contribute to existing cumulative air quality conditions.[72] As described above, the project-level thresholds for criteria air pollutants are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants. Therefore, because the Proposed Project's emissions exceed the project-level thresholds, the project would result in a considerable contribution to cumulative regional air quality impacts. As discussed above, implementation of Mitigation Measures M-AQ-1a through M-AQ-1h would reduce this impact, however, not to a less-than-significant level. Therefore, this impact would be significant and unavoidable with mitigation.

Impact C-AQ-2: The Maximum Residential or Maximum Commercial Scenarios, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative health risk impacts on sensitive receptors. (*Less than Significant with Mitigation*)

The HRA takes into account the cumulative contribution of existing localized health risks to sensitive receptors from sources included in the Citywide modeling plus the Proposed Project's sources. There are, however, other future projects, whose emissions have not been incorporated into the existing citywide health risk modeling because analysis with respect to CEQA for these future project either has not yet been prepared or is pending.

The BAAQMD has identified a distance of 1,000 feet as an appropriate zone of influence for assessing health risk impacts[73] and specifies that cumulative sources represent the combined total risk values of each individual source within the 1,000-foot evaluation zone.

Cumulative projects that are within 1,000 feet of the project site are identified in Figure 4.A.1: Location of Baseline and Foreseeable Future Projects, in Section 4.A, Introduction to Chapter 4, p. 4.A.7. There are 16 cumulative projects within this zone of influence, two of which are already completed and/or occupied. Another one of these cumulative projects is for the renewal of the lease for BAE Systems whose operations were already considered in the HRA analysis. The remaining projects are either residential, most of which have a ground floor retail or commercial component, or the proposed development of Crane Cove Park.

Citywide modeling of future health risks under 2040 conditions has been conducted by the City. This modeling includes transportation emissions for year 2040 and was based on growth projections that would have reasonably accounted for the traffic emissions from projects listed in Section 4.A Cumulative. Background (without project) cancer risk and $PM_{2.5}$ concentrations in

[72] BAAQMD, *CEQA Air Quality Guidelines*, May 2011, p. 2-1.
[73] BAAQMD, *CEQA Air Quality Guidelines*, May 2011, p. 5-2.

2040 are expected to decrease due to improved vehicle fleets and the electrification of Caltrain. Additionally, any backup diesel generators or other stationary sources that may be proposed by cumulative projects would need to meet BAAQMD permit requirements; therefore, emissions from these sources would be limited.

Citywide modeling for year 2040 does not include construction emissions because these are variable and difficult to predict. Cumulative year 2040 conditions without the project show lower background risks than the existing baseline cancer risks and consequently, addition of the project's risks cancer risk to 2040 conditions would similarly not result in new locations meeting the APEZ criteria that otherwise would not without the project with mitigation. Therefore, the project plus cumulative development projects and background risks in 2040 would not result in significant health risk impacts and the analysis in Impact AQ-3 presents a worst-case cumulative health risk analysis.

The Proposed Project would be required to implement Mitigation Measure M-AQ-1a, Construction Emission Minimization, which could reduce construction-period emissions. Additionally, Mitigation Measure M-AQ-1b, Diesel Backup Generator Specifications, would limit diesel generator emissions. Implementation of these mitigation measures would reduce the project's contribution to cumulative air quality impacts to a less-than-significant level.

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H. GREENHOUSE GAS EMISSIONS

Section 4.H, Greenhouse Gas Emissions, describes global climate change, greenhouse gas (GHG) emissions, and the existing regulatory framework governing GHG emissions, and analyzes the impacts related to GHGs associated with development of the Proposed Project. The GHG emissions analysis is based on the Proposed Project's compliance with plans and policies adopted for the purpose of reducing GHG emissions as set forth in the City's aggressive local GHG reduction plan, *Strategies to Address Greenhouse Gas Emissions*, recognized by the Bay Area Air Quality Management District (BAAQMD) as meeting the criteria of a qualified GHG Reduction Strategy.

ENVIRONMENTAL SETTING

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the sun as it is reflected back into the atmosphere, much as a greenhouse does. The accumulation of GHGs contributes to global climate change. The primary GHGs, or climate pollutants, are carbon dioxide (CO_2), black carbon, methane (CH_4), nitrous oxide (N_2O), ozone, and water vapor.

Individual development projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operational phases. While the presence of some of the primary GHGs in the atmosphere is naturally occurring, CO_2, CH_4, and N_2O are also emitted from human activities, accelerating the rate at which these compounds occur within the earth's atmosphere. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas emissions of CH_4 result from off-gassing associated with agricultural practices and landfills. Black carbon has emerged as a major contributor to global climate change, possibly second only to CO_2. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass.[1] N_2O is a by-product of various industrial processes. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. GHGs are typically reported in "carbon dioxide-equivalent" measures (CO_2E).[2]

[1] Center for Climate and Energy Solution, What is Black Carbon?, April 2010. Available online at http://www.c2es.org/docUploads/what-is-black-carbon.pdf. Accessed March 3, 2016.

[2] Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in terms of "carbon dioxide-equivalents," which presents a weighted average based on each gas's heat absorption (or "global warming") potential.

There is international scientific consensus that human-caused increases in GHGs contribute to global warming and, thus, climate change. Many impacts resulting from climate change, including sea level rise, increased fires, floods, severe storms, and heat waves, already occur and will only become more severe and costly.[3] Secondary effects of climate change likely include impacts to agriculture, the State's electricity system, and native freshwater fish ecosystems; an increase in the vulnerability of levees such as in the Sacramento-San Joaquin Delta; changes in disease vectors; and changes in habitat and biodiversity.[4,5]

GREENHOUSE GAS EMISSION ESTIMATES AND ENERGY PROVIDERS IN CALIFORNIA

The California Air Resources Board (CARB) estimated that in 2013 California produced about 459.3 million gross metric tons of CO_2E ($MMTCO_2E$).[6,7] The CARB found that transportation is the source of 37 percent of the State's GHG emissions, followed by electricity generation (both in-State generation and imported electricity) at 20 percent, and industrial sources at 23 percent. Commercial and residential fuel use (primarily for heating) accounted for 12 percent of GHG emissions.[8] In San Francisco, motorized transportation and natural gas sectors were the two largest sources of GHG emissions, accounting for approximately 35 percent (2.0 million $MTCO_2E$) and 27 percent (1.5 million $MTCO_2E$), respectively, of San Francisco's 4.75 million $MTCO_2E$ emitted in 2012.[9] Electricity consumption (building operations and transit) accounts for approximately 21 percent (1.1 million $MTCO_2E$) of San Francisco's GHG emissions.[10]

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3 Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis, Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2013. Available online at http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf. Accessed March 3, 2016.

4 Ibid.

5 California Climate Change Center, *Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California*, July 2012, p. 1. Available online at http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf. Accessed March 3, 2016.

6 California Air Resources Board (CARB), *California Greenhouse Gas Inventory for 2000-2013 - by Category as Defined in the Scoping Plan*. Available online at https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2013/ghg_inventory_scopingplan_2000-13_20150831.pdf. Accessed March 3, 2016.

7 One metric tonne (MT) is 1,000 kilograms, or 2,204.6 pounds, or 1.1 short tons. One short ton or U.S. ton is 2,000 pounds. The abbreviation for "million metric tonnes" is MMT; thus, million metric tons of CO_2-equivalent ($MMTCO_2E$).

8 CARB, California Greenhouse Gas Inventory – 2015 Edition, June 2015. Available online at http://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed March 3, 2016.

9 San Francisco Department of the Environment, *Technical Review of the 2012 Community-wide GHG Inventory for the City and County of San Francisco*, January 21, 2015. Available online at http://sfenvironment.org/download/2012-community-greenhouse-gas-inventory-3rd-party-verification-memo-january-2015. Accessed May 26, 2016.

10 Ibid.

Electricity in San Francisco is primarily provided by the Pacific Gas and Electricity Company (PG&E) and the San Francisco Public Utilities Commission (SFPUC). In 2012, electricity consumption in San Francisco was approximately 6.0 million megawatt-hours (MWh). Of this total, PG&E produced approximately 71 percent of electricity distributed (4.2 million MWh; about 81 percent of San Francisco's electricity-driven GHG emissions), and the SFPUC produced approximately 16 percent of the electricity distributed (0.9 million MWh, about 0 percent of San Francisco's electricity-driven GHG emissions).[11]

PG&E's 2015 power mix was as follows: 25 percent natural gas, 23 percent nuclear, 30 percent eligible renewables (described below), 6 percent large hydroelectric, and 17 percent unspecified power.[12]

The SFPUC operates three hydroelectric power plants in association with San Francisco's Hetch Hetchy water supply system, and provides electrical power to Muni, City buildings, and a limited number of other commercial accounts in San Francisco. Electricity generated by the Hetch Hetchy system achieved net zero GHG emissions for year 2012.[13]

REGULATORY FRAMEWORK

STATE

Executive Orders S-3-05 and B-30-15

Executive Order (EO) S-3-05 sets forth a series of target dates by which Statewide emissions of GHGs need to be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels (approximately 457 million $MTCO_2E$); by 2020, reduce emissions to 1990 levels (approximately 427 million $MTCO_2E$); and by 2050, reduce emissions to 80 percent below 1990 levels (approximately 85 million $MTCO_2E$). California produced about 452 million $MTCO_2E$ in 2010, thereby meeting the 2010 target date to reduce GHG emissions to 2000 levels.

EO B-30-15 set an additional, interim Statewide GHG reduction target of 40 percent below 1990 levels to be achieved by 2030. The purpose of this interim target is to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050.[14] EO B-30-15 also

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[11] Ibid.

[12] Pacific Gas & Electric (PG&E), PG&E's 2015 Electric Power Mix. Available online at http://www.pge.com/en/about/environment/pge/cleanenergy/index.page. Accessed May 26, 2016.

[13] San Francisco Department of the Environment, *San Francisco Climate Action Strategy*, 2013 Update. Available online at http://sfenvironment.org/sites/default/files/engagement_files/sfe_cc_ClimateActionStrategyUpdate2013.pdf. Accessed May 31, 2016.

[14] Governor's Office, *Governor Brown Establishes Most Ambitious Greenhouse Gas Reduction Target in North America*, April 29, 2015. Available online at https://www.gov.ca.gov/news.php?id=18938. Accessed March 3, 2016.

requires all State agencies with jurisdiction over sources of GHG emissions to implement measures within their statutory authority to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets.

Assembly Bill 32 and California Climate Change Scoping Plan

In 2006, the California legislature passed Assembly Bill 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the California Global Warming Solutions Act. AB 32 requires CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective Statewide GHG emissions are reduced to 1990 levels by 2020.

Pursuant to AB 32, CARB adopted the *Climate Change Scoping Plan* (*Scoping Plan*) in December 2008, outlining measures to meet the 2020 GHG reduction limits. In order to meet the goals of AB 32, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels (approximately 15 percent below 2008 levels).[15] The *Scoping Plan* estimates a reduction of 174 million $MTCO_2E$ from transportation, energy, agriculture, forestry, and other high global warming sectors (see Table 4.H.1: GHG Reductions from the AB 32 Scoping Plan Categories).[16]

The AB 32 *Scoping Plan* also anticipates that actions by local governments will result in reduced GHG emissions because local governments have the primary authority to plan, zone, approve, and permit development to accommodate population growth and the changing needs of their jurisdictions.[17] The *Scoping Plan* also relies on the requirements of Senate Bill (SB) 375 (discussed below) to align local land use and transportation planning for achieving GHG reductions.

The *Scoping Plan* must be updated every five years to evaluate AB 32 policies and ensure that California is on track to achieve the 2020 GHG reduction goal. In 2014, CARB released the *First Update to the Climate Change Scoping Plan (First Update)*, which builds upon the initial scoping plan with new strategies and recommendations. The *First Update* identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. This update defines CARB's climate change priorities for the next five years and sets the groundwork to reach long-term goals set forth in EO S-3-05. The *First Update* highlights California's progress toward meeting the near-term 2020

[15] CARB, *California's Climate Plan: Fact Sheet*. Available online at http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed March 3, 2016.
[16] Ibid.
[17] CARB, *Climate Change Scoping Plan*, December 2008, p. 27. Available online at http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed March 3, 2016.

Table 4.H.1: GHG Reductions from the AB 32 Scoping Plan Categories[18,19]

GHG Reduction Measures by Sector	GHG Reductions ($MMTCO_2E$)
Transportation Sector	62.3
Electricity and Natural Gas	49.7
Industry	1.4
Landfill Methane Control Measure	1
Forestry	5
High Global Warming Potential GHGs	20.2
Additional Reductions Needed to Achieve the GHG Cap	34.4
Other Recommended Measures	
Government Operations	1-2
Agriculture – Methane Capture at Large Dairies	1
Water	4.8
Green Buildings	26
High Recycling/Zero Waste	9
Total Reductions Counted Towards 2020 Target	**216.8-217.8**

Note: $MMTCO_2E$ = million metric tonnes of CO_2E (carbon dioxide equivalent)

GHG emission reduction goals in the initial scoping plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use.[20]

Senate Bill 375

The *Scoping Plan* also relies on the requirements of SB 375 (Chapter 728, Statutes of 2008), also known as the Sustainable Communities and Climate Protection Act of 2008, to reduce carbon emissions from land use decisions. SB 375 requires regional transportation plans developed by each of the State's 18 Metropolitan Planning Organizations to incorporate a "sustainable communities strategy" in each regional transportation plan that will then achieve GHG emission reduction targets set by CARB. For the Bay Area, the per-capita GHG emission reduction target

[18] Ibid.
[19] CARB, *California's Climate Plan: Fact Sheet*. Available online at http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed March 3, 2016.
[20] CARB, *First Update to the Climate Change Scoping Plan*, May 2014. Available online at http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed March 3, 2016.

is a 7 percent reduction by 2020 and a 15 percent reduction by 2035 from 2005 levels.[21] *Plan Bay Area*, the Metropolitan Transportation Commission's regional transportation plan, adopted in July 2013, is the region's first plan subject to SB 375 requirements.[22]

Senate Bills 1078, 107, X1-2, and 350 / Executive Orders S-14-08 and S-21-09

California established aggressive renewable portfolio standards under SB 1078 (Chapter 516, Statutes of 2002) and SB 107 (Chapter 464, Statutes of 2006), which require retail sellers of electricity to provide at least 20 percent of their electricity supply from renewable sources by 2010. EO S-14-08 (November 2008) expanded the State's renewable portfolio standard from 20 percent to 33 percent of electricity from renewable sources by 2020. In September 2009, Governor Schwarzenegger continued California's commitment to the renewable portfolio standard by signing EO S-21-09, which directed CARB to enact regulations to help California meet the renewable portfolio standard goal of 33 percent renewable energy by 2020.[23]

In April 2011, Governor Brown signed SB X1-2 (Chapter 1, Statutes of 2011) codifying the GHG reduction goal of 33 percent by 2020 for energy suppliers. This renewable portfolio standard preempts CARB's 33 percent renewable sources electricity standard and applies to all electricity suppliers (not just retail sellers) in the State, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Under SB X1-2, all of these entities must adopt the new renewable portfolio standard goals of 20 percent of retail sales from renewable sources by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020.[24] Eligible renewable sources include geothermal, ocean wave, solar photovoltaic, and wind, but exclude large hydroelectric (30 MW or more). Therefore, because the SFPUC receives more than 67 percent of its electricity from large hydroelectric facilities, the remaining electricity provided by the SFPUC is required to be 100 percent renewable.[25] SB 350 (Chapter 547, Statutes of 2015), signed by Governor Brown in October 2015, dramatically increased the stringency of the renewable portfolio standard. SB 350 establishes a renewable

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[21] CARB, *Executive Order No. G-11-024: Relating to Adoption of Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375*, February 2011. Available online at http://www.arb.ca.gov/cc/sb375/executive_order_g11024.pdf. Accessed March 3, 2016.

[22] Association of Bay Area Governments and Metropolitan Transportation Commission, *Plan Bay Area*, adopted July 18, 2013. Available online at http://planbayarea.org/plan-bay-area.html. Accessed on March 3, 2016.

[23] California Public Utilities Commission, *RPS Program Overview*, June 2015. Available online at http://www.cpuc.ca.gov/RPS_Overview/. Accessed March 3, 2016.

[24] Ibid.

[25] San Francisco Public Utilities Commission, *Approval of the Enforcement Program for the California Renewable Energy Resources Act*, December 13, 2011. Available online at https://infrastructure.sfwater.org/fds/fds.aspx?lib=SFPUC&doc=741114&data=285328890. Accessed March 3, 2016.

portfolio standard target of 50 percent by 2030, along with interim targets of 40 percent by 2024 and 45 percent by 2027.

REGIONAL

The BAAQMD is responsible for attaining and maintaining Federal and State air quality standards in the San Francisco Bay Area Air Basin, as established by the Federal Clean Air Act and the California Clean Air Act, respectively. The Clean Air Act and the California Clean Air Act require plans to be developed for areas that do not meet air quality standards, generally. The most recent air quality plan, the *Bay Area 2010 Clean Air Plan* (*Clean Air Plan*), includes a goal of reducing GHG emissions to 1990 levels by 2020, 40 percent below 1990 levels by 2035, and 80 percent below 1990 levels by 2050.[26]

In addition, the BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin; the program includes GHG-reduction measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative energy sources.[27]

The BAAQMD CEQA Air Quality Guidelines also assists lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality. The BAAQMD advises lead agencies to consider adopting a greenhouse gas reduction strategy capable of meeting AB 32 goals and then reviewing projects for compliance with the greenhouse gas reduction strategy.[28] This is consistent with the approach to analyzing GHG emissions in the CEQA Guidelines Section 15183.5.

LOCAL

San Francisco Greenhouse Gas Reduction Ordinance

In May 2008, the City adopted Ordinance No. 81-08, which amended the San Francisco Environment Code to establish GHG emissions targets and require departmental action plans and to authorize the San Francisco Department of the Environment to coordinate efforts to meet these targets. The City ordinance establishes the following GHG emissions reduction limits and target

[26] Bay Area Air Quality Management District (BAAQMD), *Clean Air Plan*, September 2010. Available online at http://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans. Accessed March 3, 2016.

[27] BAAQMD, *Climate Protection Program*. Available online at http://www.baaqmd.gov/plans-and-climate/climate-protection/climate-protection-program. Accessed May 26, 2016.

[28] BAAQMD, *California Environmental Quality Act Air Quality Guidelines*, p. 4-7, May 2012. Available online http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en. Accessed March 3, 2016.

dates by which to achieve them: determine 1990 Citywide GHG emissions by 2008, the baseline level, with reference to which target reductions are set; reduce GHG emissions by 25 percent below 1990 levels by 2017; reduce GHG emissions by 40 percent below 1990 levels by 2025; and reduce GHG emissions by 80 percent below 1990 levels by 2050.[29] The City's GHG reduction targets are consistent with—in fact, more ambitious than—those set forth in Governor Brown's recent EO B-30-15 by targeting a 40 percent reduction by 2025 rather than a 40 percent reduction by 2030.

San Francisco Greenhouse Gas Reduction Strategy

San Francisco has developed a number of plans and programs to reduce the City's contribution to global climate change and to meet the goals of the City's Greenhouse Gas Reduction Ordinance. San Francisco's *Strategies to Address Greenhouse Gas Emissions*[30] documents the City's actions to pursue cleaner energy, energy conservation, alternative transportation and solid waste policies. For instance, the City has implemented mandatory requirements and incentives that have measurably reduced GHG emissions including, but not limited to, increasing the energy efficiency of new and existing buildings, installing solar panels on building roofs, implementing a green building strategy, adopting a zero waste strategy, adopting a construction and demolition debris recovery ordinance, creating a solar energy generation subsidy, incorporating alternative fuel vehicles in the City's transportation fleet (including buses), and adopting a mandatory recycling and composting ordinance. The strategy also includes 30 specific regulations for new development that would reduce a project's GHG emissions. These GHG reduction actions have resulted in a 23.3 percent reduction in GHG emissions in 2012 compared to 1990 levels,[31] exceeding the year 2020 reduction goals in the BAAQMD's Clean Air Plan, EOs S-3-05 and B-30-15, and AB 32.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified

[29] City and County of San Francisco, *Greenhouse Gas Emissions Targets and Departmental Action Plans*, May 2008. Available online at http://environment.sanfranciscocode.org/9/. Accessed May 26, 2016.

[30] San Francisco Planning Department, *Strategies to Address Greenhouse Gas Emissions in San Francisco*, November 2010. Available online at http://sfmea.sfplanning.org/GHG_Reduction_Strategy.pdf. Accessed March 3, 2016.

[31] ICF International, *Technical Review of the 2012 Community-wide Inventory for the City and County of San Francisco*, January 21, 2015. Available online at http://sfenvironment.org/download/2012-community-greenhouse-gas-inventory-3rd-party-verification-memo-january-2015. Accessed May 26, 2016.

by the San Francisco Planning Department. The Proposed Project would have a potentially significant impact related to GHG emissions if the project were to:

H.1 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or,

H.2 Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

APPROACH TO ANALYSIS

GHG emissions and global climate change represent cumulative impacts. GHG emissions cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature; instead, the combination of GHG emissions from past, present, and future projects and activities has contributed and will contribute to global climate change and its associated environmental impacts.

The BAAQMD has prepared guidelines and methodologies for analyzing GHGs. These guidelines are consistent with CEQA Guidelines Sections 15064.4 and 15183.5, which address the analysis and determination of significant impacts from a proposed project's GHG emissions. CEQA Guidelines Section 15064.4 allows lead agencies to rely on a qualitative analysis to describe GHG emissions resulting from a project. CEQA Guidelines Section 15183.5 allows for public agencies to analyze and mitigate GHG emissions as part of a larger plan for the reduction of greenhouse gases and describes the required contents of such a plan. Accordingly, San Francisco has prepared its own greenhouse gas reduction strategy (described above), which the BAAQMD has reviewed and concluded that "aggressive GHG reduction targets and comprehensive strategies like San Francisco's help the Bay Area move toward reaching the State's AB 32 goals, and also serve as a model from which other communities can learn."[32]

The following analysis of the Proposed Project's impact on climate change focuses on the project's contribution to cumulatively significant GHG emissions. Because no individual project could emit GHGs at a level that could result in a significant impact on the global climate, this analysis is in a cumulative context, and this section does not include an individual project-specific impact statement.

[32] BAAQMD, letter from J. Roggenkamp to B. Wycko, San Francisco Planning Department, October 28, 2010. Available online at http://www.sf-planning.org/ftp/files/MEA/GHG-Reduction_Letter.pdf. Accessed November 2, 2015.

PROJECT FEATURES

The Proposed Project entails the development of the 28-Acre Site and the Illinois Parcels and would include residential, commercial-office, and retail/arts/light-industrial (RALI) uses. Under the provisions of the proposed SUD, the Proposed Project would provide a flexible land use program, under which certain parcels could be developed for primarily commercial-office or residential uses. In addition, two parcels on the project site that would be designated for district structured parking, Parcels C1 and C2, could be developed with either residential or commercial-office uses depending on future market demand and future transportation network changes. Project construction is anticipated to commence in 2018 and would be phased over an approximately 11-year period, concluding in 2029.

The Proposed Project would be a high-density, mixed-use infill development in a transit-oriented area of the City. Under the Maximum Residential Scenario, 1,142 Class I and 514 Class II bicycle parking spaces would be provided. Class II bicycle parking would also be provided at key entrance areas of the major open spaces. Under the Maximum Commercial Scenario, 995 Class I and 475 Class II bicycle parking spaces would be provided. Both scenarios would include construction of Class 2 facilities (bicycle lanes) and Class 3 facilities (shared-lane markings and signage) on 20th, 22nd, and Maryland streets. A Class 1 separated bicycle and pedestrian facility would be provided along the Bay Trail and Blue Greenway the length of the project site along the shoreline.

The Proposed Project would include a Transportation Plan, which would include the establishment of a Transportation Management Association (TMA) to manage implementation of Transportation Demand Management (TDM) measures at the site. Through the TMA, the Proposed Project would implement a number of amenities and education strategies regarding transportation choices, including real-time occupancy data for shared parking facilities, on-street carshare spaces, unbundled parking for residents, preferential treatment for high-occupancy vehicles, a website, brochures and a newsletter, as well as a dedicated Transportation Coordinator staff person.

The Proposed Project would comply with San Francisco Green Building Requirements for energy efficiency in new buildings. Energy-efficient appliances and energy-efficient lighting would be installed in the three rehabilitated historic buildings. At least 15 percent of the roof area of all proposed buildings (excluding existing Buildings 2, 12, and 21) would include roof-mounted or building-integrated solar photovoltaic (PV) systems and/or roof-mounted solar thermal hot water systems. However, the project sponsor estimates that up to 6.5 MW of solar PV panel arrays

could be located on the 600,000 sq. ft. of available unshaded roof area.[33] Over 6 MW of solar panels could offset the equivalent of 25 percent of the Proposed Project's total energy cost, assuming that 70 percent of available unshaded roof area is devoted to PV due to maintenance and other rooftop space requirements.[34]

The Proposed Project includes the installation of a recycled water system, and buildings would use recycled water for all uses authorized by the State. The Proposed Project would include the diversion and reuse of graywater and rainwater for toilet and urinal flushing and irrigation for buildings larger than 250,000 square feet. Although the City does not currently have an available source of recycled water, the project sponsors would install temporary recycled water systems to provide non-potable water for activities such as irrigation, cooling, and/or toilet and urinal flushing.

The Proposed Project would use Low Impact Design features to decrease storm water flow in accordance with San Francisco Green Building Requirements, Stormwater Management Ordinance, and the Stormwater Design Guidelines. No street trees would be removed, and new street trees would be planted along designated street segments, for a total of approximately 108 street trees. Street trees would be planted in accordance with Public Works Code Section 806(d), except for areas around the historic core, where Secretary of the Interior Standards for the Treatment of Historic Properties would be applied.

Other GHG-reducing measures include water-conserving interior features, convenient recycling and composting, and other features consistent with San Francisco's requirements. The project sponsor has prepared a Sustainability Plan that summarizes how the Pier 70 Mixed-Use District Project would attain social, economic, and environmental sustainability over the course of the Proposed Project's design, implementation, and operation.[35] Many of these features would serve to reduce energy and water consumption, which, in turn, would reduce GHG emissions. (Reductions in water use save energy that would otherwise be used to transport and treat the water.)

[33] See Memorandum to Kelly Pretzer, Forest City, from Melissa Higbee, AECOM, re: Assumptions for Pier 70 Energy Calculations, November 25, 2015, pp. 5-7.
[34] Forest City, *Pier 70 Sustainability Plan*, Draft, January 2016, p. 60.
[35] Forest City, *Pier 70 Sustainability Plan*, Draft, January 2016.

IMPACT EVALUATION

Impact C-GG-1: The Proposed Project would generate GHG emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions. (*Less than Significant*)

Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during construction and operational phases. Direct operational emissions include GHG emissions from new vehicle trips and area sources (natural gas combustion). Indirect emissions include emissions from electricity providers; energy required to pump, treat, and convey water; and emissions associated with waste removal, disposal, and landfill operations.

The Proposed Project would increase the intensity of use of the site through development of new residential, commercial, and RALI uses. Therefore, the Proposed Project would contribute to annual long-term increases in GHGs as a result of approximately 31,016 daily vehicle trips under the Maximum Residential Scenario and 34,790 daily vehicle trips under the Maximum Commercial Scenario (refer to Section 4.E, Transportation and Circulation, for further information regarding vehicle trip generation). Additional long-term increases in GHGs from residential and commercial operations associated with energy use, water use and wastewater treatment, and solid waste disposal would also occur. Construction activities would also result in increases in GHG emissions over the approximately 11-year construction period.

The Proposed Project would be subject to regulations adopted to reduce GHG emissions as identified in the GHG reduction strategy. All new buildings and additions to existing buildings under the Proposed Project (including those on Port property) would comply with the San Francisco Green Building Ordinance requirements of the San Francisco Green Building Code. As discussed below, compliance with the applicable regulations would reduce the project's GHG emissions related to transportation, energy use, waste disposal, wood burning, and use of refrigerants.

The Proposed Project would be subject to and would comply with GHG reduction measures as shown in Table 4.H.2: Regulations Applicable to the Proposed Project. Applicable regulations in Table 4.H.2 are organized by GHG sectors (e.g., transportation, energy efficiency, renewable energy, etc.) to provide direct correlation between the Proposed Project's sources of GHG emissions and regulations that would reduce those emissions. Both the Maximum Residential Scenario and the Maximum Commercial Scenario and each of the sewer and grading options would comply with San Francisco's Greenhouse Gas Reduction Strategy, and there is no substantive difference between the Maximum Residential Scenario and the Maximum Commercial Scenario with regard to GHG emissions; however, scenario-specific alterations in design, if applicable to GHG-related regulations, are shown in Table 4.H.2, pp. 4.H.13-4.H.28.

Table 4.H.2: Regulations Applicable to the Proposed Project

Regulation	Requirements	Remarks
Transportation Sector		
Commuter Benefits Ordinance (San Francisco Environment Code Section 427)	All employers of 20 or more employees nationwide must provide at least one of the following benefit programs: (1) A Pre-Tax Election consistent with 26 U.S.C. § 132(f), allowing employees to elect to exclude from taxable wages and compensation, employee commuting costs incurred for transit passes or vanpool charges, or (2) Employer Paid Benefit whereby the employer supplies a transit or vanpool subsidy for each Covered Employee. The subsidy must be at least equal in value to the current cost of the Muni Fast Pass including BART travel, or (3) Employer Provided Transportation furnished by the employer at no cost to the employee in a vanpool or bus, or similar multi-passenger vehicle operated by or for the employer.	All employers of the proposed commercial uses with 20 or more employees nationwide are required to provide at least one of the benefit programs set forth in the Commuter Benefits Ordinance.
Emergency Ride Home Program	All San Francisco companies are eligible to register for the Emergency Ride Home program. Employers must register annually. Once registered, all San Francisco employees of the company are eligible to request reimbursement.	Participation in the Emergency Ride Home Program would be part of the Transportation Demand Management (TDM) Program, and all San Francisco employees of those companies would be eligible for the benefits and services provided by the program.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Transportation Management Programs (San Francisco Planning Code Section 163)	Requires new buildings or additions over a specified size (buildings >25,000 square feet or 100,000 square feet depending on the use and zoning district) within certain zoning districts (including downtown and mixed-use districts in the City's eastern neighborhoods and south of market) to implement a Transportation Management Program and provide on-site transportation management brokerage services for the life of the building.	Prior to issuance of a temporary permit of occupancy, the project sponsors shall execute an agreement with the Director of Planning to implement an on-site transportation brokerage service and transportation management program. The Proposed Project would include a Transportation Plan intended to manage transportation demands and to encourage sustainable transportation choices, consistent with the City of San Francisco's Transit First, Better Streets, Climate Action, and Transportation Sustainability Plans and Policies. The Transportation Plan would include the establishment of a Transportation Management Association (TMA) to manage implementation of Transportation Demand Management (TDM) measures at the site. Through the TMA, the Proposed Project would implement a number of amenities and education strategies regarding transportation choices, including real-time occupancy data for shared parking facilities, on-street carshare spaces, unbundled parking for residents, preferential treatment for high-occupancy vehicles, a website, production of brochures and newsletter, as well as a dedicated Transportation Coordinator staff person.
Transportation Sustainability Fee (San Francisco Planning Code Section 411A)	Establishes Citywide fees for all new development. Fees based on a proportion of the gross area of the project based on the type of use. Fees are paid to the Department of Building Inspection and provided to the San Francisco Municipal Transportation Agency and regional providers to improve transit services.	Developers of future buildings at the project site would comply with this requirement by paying the Transportation Sustainability Fee for all applicable economic activity categories or subcategories.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Jobs-Housing Linkage Program (San Francisco Planning Code Section 413)	The Jobs-Housing Program found that new large scale developments attract new employees to the City who require housing. The program is designed to provide housing for those new uses within San Francisco, thereby allowing employees to live close to their place of employment. The program requires a developer to pay a fee or contribute land suitable for housing to a housing developer or pay an in-lieu fee.	The Proposed Project would be mixed-use and would include residential units on-site. Under the Maximum Residential Scenario, up to 3,025 residential units, 1,102,250 gsf of commercial space, and 479,980 gsf of RALI space. Under the Maximum Commercial Scenario, up to 1,645 residential units, 2,262,350 gsf of commercial space, and 486,950 gsf of RALI space. The Proposed Project would meet, or exceed, all below-market rate housing requirements or pay an in-lieu fee. For the 28-Acre Site, 30 percent of all completed residential units would be required to be offered at below market rate prices; and residential units on the Illinois Parcels would be subject to the affordable housing requirements of the City's Affordable Inclusionary Housing Ordinance. Further, under Board of Supervisors Resolution No. 54-14, if the City exercises its option to purchase the Hoedown Yard from PG&E, proceeds from the sale of the Hoedown Yard would be directed to the City's HOPE SF housing program, which includes the Potrero Terrace and Annex HOPE SF project. Additionally, developers of future buildings at the project site would comply with this requirement by paying the Jobs Housing Linkage Fee for all applicable economic activity categories or subcategories.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Bicycle Parking, Showers, and Lockers in New and Expanded Buildings (San Francisco Planning Code Sections 155.1-155.4)	Requires bicycle facilities for new and expanded buildings, new dwelling units, change of occupancy, increase of use intensity, and added parking capacity/area. Refer to Section 155.2 and 155.3 for requirements by use. Non-residential projects that add 10 or more parking spaces must: meet Planning Code Section 155 and CalGreen 5.106.4 (provide short and long-term (secure) bicycle parking for at least 5 percent of motorized vehicle capacity), whichever is stricter.	The Maximum Residential Scenario would provide up to approximately 1,142 Class 1 and 514 Class 2 bicycle parking spaces in compliance with San Francisco Planning Code, Section 155.1-155.4. The Maximum Commercial Scenario would provide up to approximately 995 Class 1 and 475 Class 2 bicycle parking spaces in compliance with San Francisco Planning Code, Section 155.1-155.4. Bicycle amenities (showers and lockers) would be provided in accordance with Planning Code requirements for both scenarios. In addition, the *Pier 70 SUD Design for Development* may require bike-share stations at Maryland Street between 21st and 22nd streets and if no other bike-share locations are in the Dogpatch neighborhood, at the intersection of Illinois Street and 20th Street. Existing commercial buildings would have up to approximately 12 Class I and 3 Class II bicycle parking spaces in the Maximum Residential Scenario. In the Maximum Commercial Scenario, existing commercial buildings would have up to approximately 33 Class I and 7 Class II bicycle parking spaces. These bicycle parking figures are included in the totals in the above paragraph.
Bicycle parking in parking garages (San Francisco Planning Code Section 155.2)	(C) Garages with more than 500 automobile spaces shall provide 25 spaces plus one additional space for every 40 automobile spaces over 500 spaces, up to a maximum of 50 bicycle parking spaces. Where parking capacity is increased by 10 or more spaces, CalGreen 5.106.4 applies.	Up to two parking structures and several parking facilities may be constructed at the project site with automobile parking spaces. If the garage(s) or underground facilities contain more than 500 automobile spaces, the required amount of bicycle parking spaces would be included. For the Maximum Residential Scenario, this is estimated at up to approximately 169 Class 2 spaces. In the Maximum Commercial Scenario, this is estimated at approximately 175 Class 2 spaces. Note that the Class 2 bicycle parking spaces are included in the overall bicycle parking figures provided in the Planning Code Sections 155.1-155.4 description, above.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Bicycle parking in Residential Buildings (San Francisco Planning Code Section 155.2)	Class 1 Bicycle Parking Spaces: (A) For projects up to 100 dwelling units, one Class 1 space for every 2 dwelling units, or (B) For projects over 100 dwelling units, one Class 1 space for every dwelling unit plus one Class 1 space for every 4 dwelling units over 100. Class 2 Bicycle Parking Spaces: One Class 2 space for every 20 dwelling units.	The Maximum Residential Scenario would provide up to approximately 906 Class 1 and 151 Class 2 bicycle parking spaces in compliance with, or in excess of, the San Francisco Planning Code, Section 115.1-155.4. The Maximum Commercial Scenario would provide up to approximately 561 Class 1 and 82 Class 2 bicycle parking spaces in compliance with, or in excess of, the San Francisco Planning Code, Section 115.1-155.4. Note that the Class 1 and Class 2 bicycle parking spaces are included in the overall bicycle parking figures provided in the Planning Code Sections 155.1-155.4 description, above.
San Francisco Green Building Requirements for Fuel Efficient Vehicle and Carpool Parking (San Francisco Green Building Code Section 5.106.5, CalGreen Sections 5.106.5 and 5.710.6.3)	Requires New Large Commercial projects, New High-rise Residential projects and Commercial Interior projects to provide designated parking for low-emitting, fuel efficient, and carpool/van pool vehicles. Mark 8 percent of parking stalls for such vehicles. For non-residential additions and interior alterations to existing buildings, the regulation applies for projects that would add 10 or more parking spaces to the project site.	The Proposed Project would comply with the San Francisco Green Building Requirements for designated parking as applicable and required. For the Maximum Residential Scenario, up to approximately 88 parking spaces for low-emitting, fuel efficient and carpool/vanpool vehicles would be designated. For the Maximum Commercial Scenario, up to approximately 181 spaces would be designated.
Car Sharing Requirements (San Francisco Planning Code Section 166)	New residential projects or renovation of buildings being converted to residential uses within most of the City's mixed-use and transit-oriented residential districts are required to provide car share parking spaces.	The Proposed Project would comply with San Francisco Planning Code Section 166, requirements for car-share parking spaces. Car share pods would be located throughout the project site, in compliance with Section 166, to reduce the need amongst on-site residents, visitors, and employees for privately owned automobiles and parking. In total, approximately 45 car share parking spaces would be provided in both the Maximum Residential and Maximum Commercial Scenarios.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Energy Efficiency Sector (includes water use reduction regulations)		
San Francisco Health Code Article 12C: Alternate Water Sources for Non-Potable Applications	Requires new buildings of 250,000 sf or more of gross floor area be constructed, operated, and maintained using available alternate water sources for toilet and urinal flushing and irrigation; that new buildings of 40,000 sf or more of gross floor area prepare water budget calculations; and that subdivision approval requirements include compliance with Article 12C.	The Proposed Project would comply with San Francisco Health Code Article 12C. Although the City does not currently have an available source of recycled water, the project sponsors would install recycled water systems to provide the project site with non-potable water needs, such as irrigation, cooling, and/or toilet and urinal flushing. Accordingly, the Proposed Project include the installation of recycled water pipelines beneath existing and proposed streets within the project area as shown on Figure 2.20: Proposed Recycled Water Distribution System. These lines would temporarily connect to the in-City, low-pressure water system at the intersection of 22nd Street with Illinois Street and the intersection of 20th Street with the proposed Louisiana Street. Backflow prevention devices would be installed at each connection to prevent backflow from the recycled water system to the potable low-pressure water system. Once the City's recycled water system is constructed, the Proposed Project's recycled water pipelines would connect to the City's recycled water system. The Eastside Recycle Water Project system is currently in the planning phase and is anticipated to be completed in 2029. Upon completion, the system is planned to connect to the project site.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
San Francisco Green Building Requirements for Energy Efficiency (San Francisco Green Building Code Sections 4.101, 4.103, 5.103)	Demonstrate compliance with Title 24 Part 6 (2013) Energy Standards, and additionally meet energy efficiency prerequisites of the applicable green building rating system: • GreenPoint Rated: demonstrate a 10 percent compliance margin • LEED for Homes (including midrise): demonstrate a 10 percent compliance margin • LEED BD+C 2009: No compliance margin requirement.	The Proposed Project would comply with the San Francisco Green Building Requirements related to energy efficiency. The project sponsors or developers of future buildings on the project site shall provide documentation demonstrating that the Title 24 Part 6 (2013) Energy Standards would be met, including the compliance margin required for the certification system chosen by the project sponsors (GreenPoint Rated or LEED Gold). The proposed buildings would exceed by 5 percent the energy efficiency requirements of Title 24 Part 6 (2013) Energy Standards, or, if Title 24 is updated in the future, the project sponsors would comply with the then-current requirements.
San Francisco Green Building Requirements: Commissioning of Building Energy and Water Systems (LEED EA3, San Francisco Green Building Code Section 5.103.1.4, CalGreen Sections 5.410.2 and 5.410.4.)	New non-residential buildings and alterations to non-residential buildings must conduct design and construction commissioning to verify energy and water using components meet the owner's or owner representative's project requirements. Commissioning requirements apply to all building operating systems covered by Title 24 Part 6, as well as process equipment and controls, and renewable energy systems. • New non-residential projects ≥25,000 sq ft: complete Enhanced Commissioning of Building Energy Systems (meeting LEED EAc3 – SFGBC 5.103.1.4 and CalGreen 5.410.) • Non-residential new buildings and alterations <25,000 square feet and ≥10,000 square feet: commission all energy systems (CalGreen 5.410) • Non-residential new buildings and alterations less than 10,000 square feet, must complete testing and adjusting of energy systems. (CalGreen 5.410.4) • New residential high rise, new commercial interior, and Major Alterations to Residential buildings must each commission building energy systems, meeting the LEED prerequisite EAp1.	All new non-residential buildings and additions to non-residential buildings under the Proposed Project would comply with the San Francisco Green Building Requirements related to the commissioning of building energy and water systems as well as commissioning requirements of Title 24 Part 6.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
San Francisco Stormwater Management Ordinance (Public Works Code, Article 4.2)	All projects disturbing more than 5,000 square feet of ground surface must manage stormwater on-site using low impact design. Comply with the Stormwater Management Ordinance, including SFPUC Stormwater Design Guidelines.	The Proposed Project is subject to these requirements because it would involve disturbance of more than 5,000 square feet of ground surface. The Proposed Project would use Low Impact Design features to decrease storm water flow. The Proposed Project would comply with all City requirements related to stormwater management, including the San Francisco Green Building Requirements, the San Francisco Stormwater Management Ordinance, and the SFPUC's Stormwater Design Guidelines.
San Francisco Green Building Requirements for water use reduction (San Francisco Green Building Code Sections 4.103.2.2 and 5.103.1.2, CalGreen Sections 4.303.1 and 5.303.2-5.303.6)	All new buildings must comply with current CA water fixture and fitting efficiency requirements. All fixtures and fittings within areas of alteration, or serving areas of alteration, must be upgraded to current CA and San Francisco fixture and fitting water efficiency requirements. (For local requirements applicable to alterations, see Commercial Water Conservation Ordinance and Residential Water Conservation Ordinance below.) Additionally: • New large commercial and high-rise residential projects need to: incorporate fixtures and fittings cutting water consumption by a total of 30 percent (LEED WEc3)	The Proposed Project would comply with the San Francisco Green Building Requirements related to water use reduction. For example, to reduce potable water demand, high-efficiency fixtures and appliances would be installed in new buildings, and fixtures in existing buildings would be retrofitted. Further, although the City does not currently have an available source of recycled water, the project sponsors would install recycled water systems to provide non-potable water for activities such as irrigation, cooling, and/or toilet and urinal flushing. Once the City's recycled water system is constructed, the Proposed Project's recycled water pipelines would connect to the City's recycled water system.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Commercial Water Conservation Ordinance (San Francisco Building Code, Chapter 13A)	Requires all alterations to existing commercial properties to achieve the following: 1. If showerheads have a maximum flow >2.5 gallons per minute (gpm), replace with ≤2.0 gpm. 2. All showers have no more than one showerhead per valve. 3. If faucets and faucet aerators have a maximum flow rate >2.2 gpm, replace with unit meeting current code: • Non-residential lavatory: ≤0,4 gpm • Kitchen faucet: ≤0.8 gpm • Metering faucet: ≤0.2 gal/cycle 4. If toilets have a maximum rated water consumption >1.6 gallons per flush (gpf), replace with ≤1.28 gpf toilet. 5. If urinals have a maximum flow rate >1.0 gpf, replace with ≤0.5 gpf unit. 6. Repair all water leaks.	Existing operable structures on the project site would be required to comply with this subject ordinance by January 1, 2017. To reduce potable water demand, high-efficiency fixtures and appliances would be installed in new buildings, and fixtures in existing buildings would be retrofitted.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Residential Water Conservation Ordinance (San Francisco Building Code, Housing Code, Chapter 12A)	Requires all residential properties (existing and new), prior to sale, to upgrade to the following minimum standards: 1. If showerheads have a maximum flow >2.5 gpm, replace with ≤2.0 gpm. 2. All showers have no more than one showerhead per valve. 3. If faucets and faucet aerators have a maximum flow rate >2.2 gpm, replace with unit meeting current code: • Non-residential lavatory: ≤0.4 gpm • Residential lavatory: ≤1.5 gpm • Kitchen faucet: ≤0.8 gpm • Metering faucet: ≤0.2 gal/cycle 4. If toilets have a maximum rated water consumption >1.6 gpf, replace with ≤1.28 gpf toilet 5. If urinals have a maximum flow rate >1.0 gpf, replace with ≤0.5 gpf unit. 6. Repair all water leaks. Although these requirements apply to existing buildings, compliance must be completed through the Department of Building Inspection, for which a discretionary permit (subject to CEQA) would be issued.	The Proposed Project would comply with this requirement by meeting the standards set forth in the Residential Water Conservation Ordinance. To reduce potable water demand, high-efficiency fixtures and appliances would be installed in new buildings, and fixtures in existing buildings would be retrofitted.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
San Francisco Water Efficient Irrigation Ordinance (San Francisco Administrative Code Chapter 63)	Projects that include 500 square feet (sf) or more of new or modified landscape are subject to this ordinance, which requires that landscape projects be installed, constructed, operated, and maintained in accordance with rules adopted by the SFPUC that establish a water budget for outdoor water consumption. Tier 1: 1,000 square feet <= project's modified landscape <2,500 sf Tier 2: (A) New project landscape area is greater than or equal to 500 sf or; (B) the project's modified landscape area is greater than or equal to 2,500 sf. Note: Tier 2 compliance requires the services of landscape professionals. See the SFPUC Web site for information regarding exemptions to this requirement. www.sfwater.org/landscape	The Proposed Project would be subject to Tier 2 requirements because it includes a new landscape area greater than or equal to 500 sf. The Proposed Project would be in compliance with rules adopted by the SFPUC for Tier 2 project landscaping. Although the City does not currently have an available source of recycled water, the project sponsors would install temporary recycled water systems to provide the project site with non-potable water needs, such as irrigation, cooling, and/or toilet and urinal flushing. Once the City's recycled water system is constructed, the recycled water pipelines would connect to the City's recycled water system.
San Francisco Existing Commercial Buildings Energy Performance Ordinance (San Francisco Environment Code Chapter 20)	Owners of nonresidential buildings in San Francisco with ≥10,000 square feet that are heated or cooled must conduct energy efficiency audits, as well as to annually measure and disclose energy performance. Certain exceptions apply for new construction or if specified performance criteria are met.	All of the three existing buildings to remain would comply with San Francisco Environment Code Chapter 20 by benchmarking energy use every year and receiving an energy audit every five years unless performance criteria are met through renovation.
Light Pollution Reduction (CalGreen Section 5.106.8)	For nonresidential projects, comply with lighting power requirements in CA Energy Code, CCR Part 6. Meet California Energy Code minimum for Lighting Zones 1-4 with Backlight/Uplight/Glare ratings meeting CalGreen Table 5.106.8.	The Proposed Project would comply with San Francisco Green Building Requirements for light pollution reduction as applicable and required.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Renewable Energy		
San Francisco Green Building Requirements for Renewable Energy (San Francisco Green Building Code Section 4.201.2)	Newly constructed residential and non-residential buildings of 10 occupied floors or less shall install solar photovoltaic systems and/or solar thermal systems in the solar zone required by California Code of Regulations, Title 24, Part 6 Section 110.10.	The Proposed Project would include for roof-mounted or building-integrated solar photovoltaic (PV) systems and/or roof-mounted solar thermal hot water systems for all proposed buildings, excluding existing Buildings 2, 12, and 21. At least 15 percent of the roof area would include roof-mounted or building-integrated solar PV systems and/or roof-mounted solar thermal hot water systems in residential and commercial buildings. These systems would partially offset the energy demands of the associated buildings.
Waste Reduction Sector		
Mandatory Recycling and Composting Ordinance (San Francisco Environment Code, Chapter 19 and CalGreen Section 5.410.1)	All persons in San Francisco are required to separate their refuse into recyclables, compostables and trash, and place each type of refuse in a separate container designated for disposal of that type of refuse. (San Francisco Environment Code Chapter 19) All new construction, renovation and alterations must provide for the storage, collection, and loading of recyclables, compost and solid waste in a manner that is convenient for all users of the building. (San Francisco Environment Code Chapter 19 and CalGreen 5.410.1)	Under the Proposed Project, typical trash collection trucks would drive around the project site to pick up solid waste from each individual building separated by residents and businesses into recyclables, compostables, and trash for the landfill. The Proposed Project would comply with San Francisco's Green Building Requirements by providing for recycling, compost, and solid waste collection and loading that is convenient for all users.
San Francisco Construction and Demolition Debris Recovery Ordinance (San Francisco Environment Code, Chapter 14, San Francisco Building Code Chapter 13B, and San Francisco Health Code Section 288)	Applies to all projects: No construction and demolition material may be taken to landfill or placed in the garbage. All (100 percent of) mixed debris must be transported by a registered hauler to a registered facility to be processed for recycling. Source separated material must be taken to a facility that recycles or reuses those materials. Additionally, projects that include full demolition of an existing structure must submit a waste diversion plan to the Director of the Department Environment and the plan must provide for a minimum of 65 percent diversion from landfill of construction and demolition debris, including materials source separated for reuse or recycling.	The Proposed Project would comply with San Francisco Green Building Requirements for construction and demolition debris recovery in connection with the proposed demolition by submitting a waste diversion plan to the Director of the Environment. The Proposed Project would not take construction and demolition material directly to a landfill or place it directly in the garbage.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
San Francisco construction and demolition debris recycling requirements (San Francisco Green Building Code Sections 5.103.1.3 and 4.103.2.3)	In addition to complying with the Construction and Demolition Debris Recovery Ordinance, new commercial buildings of ≥25,000 square feet and new residential buildings of 4 or more occupied floors must develop a plan to divert a minimum of 75 percent of construction and demolition debris from landfill, and meet LEED Materials & Resources Credit 2.	The ordinance applies to the Proposed Project because it would include new commercial buildings of ≥25,000 square feet and new residential buildings of 4 or more occupied floors. The Proposed Project would comply with San Francisco Green Building Requirements for construction and demolition debris recycling by submitting a plan to divert a minimum of 75% of construction and demolition debris from landfill and meeting LEED Materials & Resources Credit 2.
Environment/Conservation Sector		
Street Tree Planting Requirements (San Francisco Public Works Code Section 806(d))	Public Works Code Section 806(d) requires projects that include new construction, significant alterations, new curb cuts, a new garage, or new dwelling units to plant a 24-inch box tree for every 20 feet along the property street frontage.	The Proposed Project would plant street trees in accordance with Public Works Code Section 806(d) including along 22nd Street and Maryland Street. Street trees would be permitted, but not required, along Illinois Street, 20th Street, 21st Street, and Louisiana Street. Secretary of the Interior Standards for the Treatment of Historic Properties would be applied to retain the historic industrial character for areas around the historic core. The *Pier 70 SUD Design for Development* would outline street tree planting requirements that are responsive to features of the Union Iron Works Historic District, and therefore restrict street trees along certain street segments. The Proposed Project would plant street trees along designated street segments, for a total of approximately 108 required street trees.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Construction Site Runoff Pollution Prevention for New Construction (San Francisco Public Works Code, Article 4.2)	Construction Site Runoff Pollution Prevention requirements depend upon project size, occupancy, and the location in areas served by combined or separate sewer systems. Any project disturbing ≥5,000 square feet of ground surface is required to submit and receive approval of an Erosion and Sediment Control Plan prior to commencing any construction-related activities. The plan must be site-specific, and details the use, location, and emplacement of the sediment and erosion control devices at the project site. All construction sites, regardless of size, must implement BMPs to prevent illicit discharge into the sewer system. For more information on San Francisco's requirements, see www.sfwater.org.	The Proposed Project would comply with all applicable City requirements related to the prevention of construction site runoff pollution, which would include the preparation of an erosion and sediment control plan, a stormwater soil loss prevention plan, or a Stormwater Pollution Prevention Plan.
Enhanced Refrigerant Management (CalGreen Sections 5.508.1.2 and 5.508.2)	Commercial buildings must not install equipment that contains chlorofluorocarbons or halons. Applies to new construction and all alterations. New commercial refrigeration systems containing refrigerants with Global Warming Potential (GWP) of 150 or greater, installed in food stores with 8,000 square feet or more of refrigerated display cases, walk-in coolers or freezers connected to remote compressor units or condensing units: Piping shall meet all requirements of 5.508.2 (all sections), and shall undergo pressure testing during installation prior to evacuation and charging. System shall stand unaltered for 24 hours with no more than a one pound pressure change from 300 psig.	The Proposed Project would comply with applicable requirements for enhanced refrigerant management as applicable and required.
Low-emitting Adhesives, Sealants, Caulks, Paints, Coatings, Composite wood, and Flooring (CalGreen Section 4.504)[36]	Adhesives, sealants, and caulks - Comply with volatile organic compound (VOC) limits in South Coast Air Quality Management District Rule 1168 VOC limits and California Code of Regulations Title 17 for aerosol adhesives. Paints and coatings - Comply with VOC limits in the Air Resources Board Architectural Coatings	The Proposed Project would comply with applicable requirements for low-emitting materials (adhesives, sealants, caulks, paints, coatings, composite wood, and flooring) as applicable and required.

[36] While not a GHG, VOCs are precursor pollutants that form ground level ozone. Increased ground-level ozone is an anticipated effect of future global warming that would result in added health effects locally. Reducing VOC emissions would reduce the anticipated local effects of global warming.

Table 4.H-2 Continued

Regulation	Requirements	Remarks
	Suggested Control Measure and California Code of Regulations Title 17 for aerosol paints. Carpet - All carpet must meet one of the following: 1. Carpet and Rug Institute Green Label Plus Program, 2. California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350), 3. NSF/ANSI 140 at the Gold level, 4. Scientific Certifications Systems Sustainable Choice, OR 5. California Collaborative for High Performance Schools (CHPS) EQ 2.2 and listed in the CHPS High Performance Product Database and carpet cushion must meet Carpet and Rug Institute Green Label, and indoor carpet adhesive & carpet pad adhesive must not exceed 50 gallons per VOC content. Composite wood - Meet CARB Air Toxics Control Measure for Composite Wood, including meeting the emission limits in CalGreen Table 5.504.4.5. Resilient flooring systems - For 80 percent of floor area receiving resilient flooring, install resilient flooring complying with: 1. Certified under the Resilient Floor Covering Institute FloorScore program, 2. Compliant with the VOC-emission limits and testing requirements of California Department of Public Health 2010 Standard Method for the Testing and Evaluation Chambers v.1.1, 3. Compliant with the CHPS EQ2.2 and listed in the CHPS High Performance Product Database, OR 4. Certified under the Greenguard Children & Schools Program to comply with California Department of Public Health criteria.	

Table 4.H-2 Continued

Regulation	Requirements	Remarks
Low-emitting Adhesives, Sealants, Caulks, Paints, Coatings, Composite wood, and Flooring (CalGreen Sections 4.504.2 - all sections)	Interior paints and coatings: Comply with VOC limits in the Air Resources Board Architectural Coatings Suggested Control Measure and California Code of Regulations Title 17 for aerosol paints. See CalGreen Table 4.504.3 for details. Aerosol paints and coatings - Meet BAAQMD VOC limits (Regulation 8, Rule 49) and Product-Weighted Maximum Incremental Reactivity Limits for Reactive Organic Compound. (California Code of Regulations Title 17, Section 94520) Caulks, Construction adhesives, and Sealants - Meet South Coast Air Quality Management District Rule 1168. See CalGreen Tables 4.504.1 and 4.504.2. Composite Wood - Meet CARB Airborne Toxic Control Measure formaldehyde limits for composite wood. See CalGreen Table 4.504.5.	The Proposed Project would comply with applicable requirements for low-emitting materials (adhesives, sealants, caulks, paints, coatings, composite wood, and flooring) as applicable and required.
Wood Burning Fireplace Ordinance (San Francisco Building Code, Chapter 31, Section 3111.3; CalGreen Sections 4.503.1 and 5.503.1)	Bans the installation of wood burning fire places (except those that are designed for food preparation in new or existing restaurants or bakeries) except for direct-vent or sealed combustion units compliant with EPA Phase II limits (CalGreen 4.503.1 and 5.503.1) and at least one of the following: • Pellet-fueled wood heater • EPA approved wood heater • Wood heater approved by the Northern Sonoma Air Pollution Control District	This Proposed Project would not include the installation of wood burning fireplaces. To the extent wood burning fireplaces designed for food preparation in new restaurants and bakeries are included, they would comply with applicable requirements.

Note: The GHG Analysis Compliance Checklist for the Pier 70 Mixed-Use District Project has been prepared for the Proposed Project and variants. However, the GHG Checklist provided in the EIR (Table 4.H.2: Regulations Applicable to the Proposed Project) analyzes only the Proposed Project. A GHG emissions analysis for the project variants is provided separately in Chapter 6, Project Variants.

Source: San Francisco Planning Department, GHG Analysis Compliance Checklist for the Pier 70 Mixed-Use District Project, dated November 18. 2015

Compliance with the City's Commuter Benefits Program, transportation management programs, Transportation Sustainability Fee, Jobs-Housing Linkage Program, bicycle parking requirements, low-emission car parking requirements, and car sharing requirements would reduce the Proposed Project's transportation-related emissions.[37] The regulations reduce GHG emissions from single-occupancy vehicles by promoting the use of alternative transportation modes with zero or lower GHG emissions on a per capita basis.

The Proposed Project would be required to comply with the energy efficiency requirements of the City's Green Building Code, Stormwater Management Ordinance, Water Conservation and Irrigation ordinances, and Energy Conservation Ordinance, which would promote energy and water efficiency, thereby reducing the Proposed Project's energy-related GHG emissions.[38] Additionally, the project would be required to meet the renewable energy criteria of the Green Building Code, further reducing the project's energy-related GHG emissions.

The Proposed Project's waste-related emissions would be reduced through compliance with the City's Recycling and Compositing Ordinance, Construction and Demolition Debris Recovery Ordinance, and Green Building Code requirements. These regulations reduce the amount of materials sent to a landfill, reducing GHGs emitted by landfill operations. These regulations also promote reuse of materials, conserving their embodied energy[39] and reducing the energy required to produce new materials.

Compliance with the City's Street Tree Planting requirements would serve to increase carbon sequestration. Other regulations, including those limiting refrigerant emissions and the Wood Burning Fireplace Ordinance would reduce emissions of GHGs and black carbon, respectively. Regulations requiring low-emitting finishes would reduce volatile organic compounds (VOCs).[40] Thus, the Proposed Project was determined to be consistent with San Francisco's GHG reduction strategy.[41]

The project sponsors are required to comply with these regulations, which have proven effective as San Francisco's GHG emissions have measurably decreased when compared to 1990

[37] The Proposed Project would be required to meet the objectives of the Transportation Demand Management (TDM) Ordinance. The TDM Ordinance requires development projects to incorporate design features, incentives, and tools that support alternative forms of transportation.

[38] Compliance with water conservation measures reduce the energy (and GHG emissions) required to convey, pump and treat water required for the project.

[39] Embodied energy is the total energy required for the extraction, processing, manufacture and delivery of building materials to the building site.

[40] While not a GHG, VOCs are precursor pollutants that form ground level ozone. Increased ground level ozone is an anticipated effect of future global warming that would result in added health effects locally. Reducing VOC emissions would reduce the anticipated local effects of global warming.

[41] San Francisco Planning Department, *Greenhouse Gas Analysis: Compliance Checklist for Pier 70 Mixed-Use District Project*, November 18, 2015.

emissions levels, demonstrating that the City has met and exceeded EO S-3-05, AB 32, Clean Air Plan GHG reduction goals for the year 2020. Other existing regulations, such as those implemented through AB 32, will continue to reduce a proposed project's contribution to climate change. In addition, San Francisco's local GHG reduction targets are consistent with the long-term GHG reduction goals of EO S-3-05, EO B-30-15, AB 32, and the Clean Air Plan.

Furthermore, as discussed in the Regulatory Setting section above, the land use strategy in *Plan Bay Area* is intended to meet the per-capita GHG reduction targets of 7 percent by 2020 and 15 percent by 2035 from 2005 levels. *Plan Bay Area's* land use strategy is to promote future development around existing and planned transit nodes. New development areas that would support the day-to-day needs of residents and workers in a pedestrian-friendly environment served by transit are identified as Priority Development Areas (PDAs) in *Plan Bay Area*. As stated in the *Plan Bay Area Environmental Impact Report*, implementation of the land use and transportation strategies in *Plan Bay Area* would reduce GHG emissions by 15 percent between 2010 and 2040.[42] *Plan Bay Area* meets the requirements of SB 375 by developing an integrated transportation and land use plan that would attain per-capita GHG emissions reduction targets of 7 percent by 2020 and 15 percent by 2035 from 2005 levels.[43]

Because the Proposed Project would be located within a PDA, consistent with *Plan Bay Area's* land use strategy, it would assist in reducing projected levels of regional GHG land use emissions. Furthermore, because it is located within a PDA and would provide housing and commercial uses within the PDA, the Proposed Project would be consistent with *Plan Bay Area* and would further the State and regional goals of accommodating growth in ways that would reduce GHG emissions.

Therefore, because the Proposed Project is consistent with the City's GHG reduction strategy, it is also consistent with the GHG reduction goals of EO S-3-05, EO B-30-15, AB 32, and the Clean Air Plan, would not conflict with these plans, and would therefore not exceed San Francisco's applicable GHG threshold of significance. As such, the Proposed Project would result in a less-than-significant impact with respect to GHG emissions. No mitigation measures are necessary.

While the Proposed Project would result in a less-than-significant impact from GHG emissions, it is worth noting that a number of mitigation measures identified in this EIR would also have the added co-benefit of even further reducing GHG emissions from the Proposed Project. These mitigation measures and an explanation of how they would reduce the project's GHG emissions are described below.

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[42] ABAG and Metropolitan Transportation Commission, *Environmental Impact Report for Plan Bay Area*, Draft, April 2013. p. 2.5-56.

[43] ABAG and Metropolitan Transportation Commission, *Environmental Impact Report for Plan Bay Area*, Draft, April 2013. p. ES-5.

Mitigation Measure M-AQ-1g: Transportation Demand Management, shown in Section 4.G, Air Quality, on pp. 4.G.47-4.G.50, would require the reduction of the project's one-way vehicle trips by 20 percent through the implementation of Transportation Demand Management (TDM) strategies. Components of the TDM Plan would encourage use of transit and non-motorized modes of transportation which would help reduce emissions of GHGs. In addition, Mitigation Measures MM-AQ-1a through MM-AQ-1g, pp. 4.G.42 -4.G.51, would help reduce emissions of GHGs through the reduction in construction emissions; limitations on diesel generators; use of low VOC architectural coatings and green consumer products; electrification of loading docks; and emission offsets.

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I. WIND AND SHADOW

Section 4.I, Wind and Shadow, discusses both wind and shadow impacts. Wind is discussed first, followed by a separate discussion of shadow that begins on p. 4.I.69.

WIND

The Wind subsection describes the Proposed Project's impacts on ground-level wind currents at various locations on the project site and in the vicinity. The Environmental Setting discussion includes a general description of the wind environment in San Francisco and a discussion of regulations related to the review of wind impacts from proposed development projects. The Impacts discussion describes significance criteria for determining if wind impacts are significant under CEQA; existing wind conditions on the project site; the wind impacts of the Proposed Project and cumulative development projects; and mitigation and improvement measures. The discussion of wind impacts in this subsection is supported by a pedestrian wind study prepared by an independent consultant.[1]

Because the project site area is changing rapidly, and there are known development and infrastructure projects currently underway, a baseline other than existing conditions is appropriate for the analyses presented in this subsection. The baseline includes projects that were under construction at the time the Notice of Preparation (NOP) was published or that have been approved and funded and would be either under construction or completed by the time the Proposed Project is under construction. See "Approach to Baseline Setting" in Section 4.A, Introduction to Chapter 4, pp. 4.A.5-4.A.13, and "Approach to Analysis" in this Wind subsection, pp. 4.I.7-4.I.9.

ENVIRONMENTAL SETTING

EXISTING CLIMATE AND WIND CONDITIONS

The difference in atmospheric pressure between two points on the earth causes air masses to move from the area of higher pressure to the area of lower pressure. This movement of air masses results in wind currents. In San Francisco, wind direction is most variable during the winter, when strong southerly winds, which are frequent during the approach of a winter storm, occur. Average wind speeds are highest during the summer and lowest during the winter.

[1] Rowan Williams Davies & Irwin, Inc. (RWDI), Pier 70 Mixed Use District Project EIR; Final Report: Pedestrian Wind Study, Wind Tunnel Tests, dated July 18, 2016 (hereinafter referred to as "Pedestrian Wind Study").

Typically, regardless of season, the highest wind speeds occur around the mid-afternoon through early evening hours, and the lowest wind speeds occur around the early morning hours.

As winds move over the land, they encounter surface roughness and take on differing characteristics due to differing topography, vegetation, and structures that all act to slow the wind at ground level and to create turbulence. However, when winds reach large areas of smooth, flat surfaces, such as open land or the waters of San Francisco Bay, the speed of the wind near that smooth surface will increase, and the level of turbulence in the wind will decrease.

The following descriptions of San Francisco Bay Area (Bay Area) climate and wind, topography and winds, and wind flows, which both paraphrase and directly quote from the Bay Area Air Quality Management District's (BAAQMD's) *Climate, Physiography, and Air Pollution Potential – Bay Area and Its Subregions*,[2] explain why and how those winds at the project site differ from those winds that occur in downtown San Francisco.

Bay Area Climate and Wind

During the summer, the California coastal climate is dominated by the Pacific High, a semi-permanent high-pressure cell over the northeastern Pacific Ocean. This high, together with a thermal low over the Sonoran-Mojave Desert, causes northwest airflow along the coast and onshore winds over the Bay Area during much of the summer. Marine air approaching the coast, already cool from travelling over the ocean, is further cooled as it crosses the very cold ocean waters that lie near the coast. This cold, dense marine layer of air is the major source of the stronger local summer winds in the Bay Area. During the winter, the Pacific High weakens and shifts southward, and winter storms become frequent, with occasional strong winds as storm fronts pass through the region. During winter rainy periods, winds are often moderate. When the Pacific High becomes dominant during the winter, temperature inversions[3] become strong and often are surface-based; winds are light.

The Bay Area experiences stable atmospheric conditions. The inversion layer is typically about 1,500 feet above sea level and is usually created by subsidence, the heating of downward-moving air in the Pacific High. The marine inversion often moves lower in the afternoon during the summer. In July and August, it is frequently at 500 to 1,000 feet in the afternoon, but at 1,000 to 1,500 feet in the morning.

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[2] BAAQMD, *Climate, Physiography, and Air Pollution Potential - Bay Area and Its Subregions.* Available at http://hank.baaqmd.gov/dst/papers/bay_area_climate.pdf. Accessed November 21, 2015.

[3] A temperature inversion occurs in the atmosphere when a layer of air is warmer than the layer of air that lies below it. Under normal atmospheric conditions, the air is heated from the ground up and the temperature of air decreases regularly as altitude increases.

Bay Area Topography and Wind

Bay Area terrain is complex. In the Bay Area, the northwest-southeast trending Coast Range (hills) is divided into western and eastern ranges, with San Francisco Bay between them. The Bay Area contains sea-level passes, or gaps, through the Coast Range. The Golden Gate is the sea-level gap in the western range and the Carquinez Strait is the sea-level gap in the eastern range. These two sea-level gaps allow air to flow relatively freely between the coast and the Central Valley, generally following a path over the intervening San Francisco Bay and low lands that lie between the two gaps.

Ridges at elevations of 1,500 feet and higher in the eastern and western ranges of the Coast Range are high enough to distort surface wind flows through the Bay Area. The distortion is greatest when low-level inversions are present and the surface air flows independently from the air above the inversion. This is very common during the summer, when the surface air mass of the marine layer turns into the sea breeze.

San Francisco is located at a low-lying gap within the Coast Range, with the Marin peninsula northward from the Golden Gate, and the Santa Cruz range southward from around Pacifica. The marine layer can easily pass over much of low-lying San Francisco, as well as through the Golden Gate, resulting in high winds on the San Francisco Bay and in San Francisco.

Project Site Wind Conditions

The eastern portion of San Francisco experiences the predominant wind pattern effects described above. United States Weather Bureau meteorological data that are representative of downtown and eastern San Francisco were gathered at the old San Francisco Federal Building at 50 United Nations Plaza (at a height of 132 feet) during the six-year period of 1945 to 1950. These data describe the speed, direction, and frequency of occurrence of winds, and were used in the Pedestrian Wind Study. These meteorological data, along with data from the BAAQMD, show that winds from the northwest, west-northwest, west, and west-southwest (NW, WNW, W, WSW, respectively) are the most prevalent.

Sites adjacent to San Francisco Bay, such as the 28-Acre Site, are susceptible to strong winds throughout both the day and year. Over San Francisco Bay, there is no intervening topography to slow down the wind.

BUILDINGS AND WIND SPEED

The direction and speed of wind currents can be altered by natural features of the land or by buildings and structures. Flat, open ground without buildings or trees allows wind to proceed

unobstructed. The existing project area has large expanses of asphalt that create this unobstructed condition.

Groups of buildings clustered together tend to act as obstacles that reduce wind speeds; the heights, massing, and orientations or profiles of the buildings are some of the factors that can affect wind speeds.

When a building is in the open or much taller than those around it, rather than a similar height, it can intercept and redirect winds downward that might otherwise flow overhead. The winds can be directed down the vertical face of the building to ground level, and these redirected winds can be relatively strong and relatively turbulent.

The massing of a building can affect wind speeds. In general, slab-shaped buildings have the greatest potential to accelerate ground-level winds, while buildings that have setbacks, unusual shapes or are more geometrically complex often result in lower ground-level wind speeds. However, irregular shapes may also increase wind speeds in particular areas, depending on the circumstance.

The orientation or profile of a building is another factor that can affect wind speeds. When the wide face of a building, as opposed to its narrow face, is oriented perpendicular to the prevailing wind direction, the building has more surface area to intercept and redirect winds down to ground level, increasing the probability of strong and turbulent winds at ground level.

Another aspect is whether buildings of similar heights are together or a few buildings stand much taller than the rest. Clustered buildings in a downtown area can improve wind conditions at street level, while taller buildings can cause wind problems for pedestrians. The condition that will prevail depends upon the details of the situation. The existing project site is characterized by large open areas interspersed with relatively low-rise buildings. These characteristics do not provide shelter from wind.

WIND SPEED AND PEDESTRIAN COMFORT

The comfort of pedestrians varies under different conditions of sun exposure, temperature, clothing, and wind speed. Winds up to 4 miles per hour (mph) have no noticeable effect on pedestrian comfort. With winds from 4 to 8 mph, wind is felt on the face. Winds from 8 to 13 mph will disturb hair, cause clothing to flap, and extend a light flag mounted on a pole. Winds from 13 to 19 mph will raise loose paper, dust, and dry soil, and will disarrange hair. With winds from 19 to 26 mph, the force of the wind will be felt on the body. With 26- to 34-mph winds, umbrellas are used with difficulty, hair is blown straight, walking steadily is difficult, and wind

noise is unpleasant. Winds over 34 mph increase difficulty with balance, and gusts can be hazardous and can blow people over.

REGULATORY FRAMEWORK

In order to provide a safe and comfortable wind environment for people in San Francisco, the City has established comfort and hazard criteria for use in evaluating the wind effects of proposed buildings. Section 148 of the Planning Code, "Reduction of Ground-level Wind Currents in C-3 Districts," specifically outlines these criteria for the Downtown Commercial (C-3) Districts. Additional Planning Code sections apply the same criteria to the Rincon Hill, Van Ness Avenue, and South of Market areas. As explained below, under Section 148, new buildings and additions within specific areas of San Francisco may not cause wind speeds that meet or exceed this hazard criterion, i.e., such projects will not be approved.

Although the requirements and criteria of Section 148 do not apply to the project site, the wind hazard criterion that is defined in Section 148 is used by the Planning Department as a significance threshold in the CEQA environmental review process to assess the environmental impact of projects throughout San Francisco and is therefore the basis of the analysis in this Environmental Impact Report (EIR). Planning Code Section 148 criteria are based on pedestrian-level wind speeds that include the effects of wind turbulence; these are referred to as "equivalent wind speeds," defined in the Planning Code as "an hourly mean wind speed adjusted to incorporate the effects of gustiness or turbulence on pedestrians."

Section 148 establishes equivalent wind speeds of 7 mph as the comfort criterion for public seating areas and 11 mph as the comfort criterion for areas of substantial pedestrian use, and states that new buildings and additions to buildings may not cause ground-level winds to exceed these levels more than 10 percent of the time year round between 7:00 a.m. and 6:00 p.m. Section 148 also establishes a hazard criterion, a 26 mph equivalent wind speed for a single full hour of the year.

Although Section 148 does not apply to the project site or to the Proposed Project, this EIR's impact analysis significance threshold is based on the hazard criterion defined in Section 148. The measured equivalent wind speeds that were exceeded 10 percent of the time year round between 7:00 a.m. and 6:00 p.m. are provided here for informational purposes;[4] this information relates to the Section 148 pedestrian comfort criteria and is commonly reported in San Francisco

[4] The typical procedure for wind tunnel testing of locations subject to Section 148 relies on wind data collected from the United States Weather Bureau weather station atop the Federal Building at 50 United Nations Plaza during the six-year period of 1945 to 1950. Wind data from 7:00 a.m. to 6:00 p.m. are used, because this time period represents peak pedestrian activity in a downtown setting.

EIRs; however, the Section 148 comfort criteria are not used to evaluate the significance of wind impacts in this EIR.

The pedestrian comfort criteria and comparisons of wind speeds to those criteria provide information about the usability of the project site. This helps inform planners and designers about open spaces, sidewalks, and bike paths.

The Section 148 comfort criteria are based on wind speeds measured and averaged over 1 minute, the same averaging time as the weather bureau wind data. In contrast, the hazard criterion is defined by a wind speed that is measured and averaged over 1 hour; when stated on the same time-basis as the comfort criteria wind speeds, the hazard criterion wind speed (26 mph for a full hour) is a 1-minute average wind speed of 36 mph.[5,6]

According to Section 148, if wind testing of proposed buildings is necessary, it shall be performed according to test protocols agreed to by the Planning Department.[7] The protocols include, among other things, defining the extent and content of the wind test model, the elements to be included in each wind test scenario, the test point locations, and the use of the wind speed profiles that apply to the test site, so that the scaling of the wind tunnel test results will be correct.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The proposed project would have a significant impact related to wind, if it would:

- Alter wind in a manner that substantially affects public areas.

To assess whether a project would result in a significant impact under this criterion, the City uses the Planning Code's hazard criterion; that is, it determines whether a project would cause equivalent wind speeds to reach or exceed the wind hazard level of 26 mph for a single hour of

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[5] Arens, E; Ballanti, D; Bennett, C.; Guldman, S.; White, B., "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance" (hereinafter referred to as "Developing the San Francisco Wind Ordinance"), Building and Environment, Vol. 24, No. 4, pp. 297-303, 1989. Available at http://escholarship.org/uc/item/2pd6f6kb. Accessed November 15, 2015.

[6] The wind hazard criterion is derived from the 26 mph hourly average wind speed that would generate a 3-second gust of wind at 20 meters per second, a commonly used guideline for wind safety. Because the original Federal Building wind data were collected at 1-minute averages (i.e., a measurement of sustained wind speed for 1 minute, collected once per hour), the 26 mph hourly average is converted to a 1-minute average of 36 mph, which is used to determine compliance with the 26 mph 1-hour hazard criterion in the Planning Code. (Arens, E. et al., "Developing the San Francisco Wind Ordinance," Building and Environment, Vol. 24, No. 4, pp. 297-303, 1989.)

[7] Section 148(c). Procedures and Methodologies for implementing this section shall be specified by the Office of Environmental Review of the Department of City Planning. (Added by Ord. 414-85, App. 9/17/85; amended by Ord. 188-15, File No. 150871, App. 11/4/2015, Eff. 12/4/2015.) 9/17/85)

the year. (As explained above under Regulatory Framework, pp. 4.I.5-4.I.6, the 26 mph on an hourly averaged basis is equivalent to 36 mph on a minute-averaged basis. The tables on pp. 4.I.17-4.I.36 provide wind speeds compared to 36 mph.) If a project would cause a wind hazard or add to an existing wind hazard in a public area, it may result in a significant impact under CEQA, because the project would result in hazardous wind conditions for pedestrians. However, a new wind hazard location is not necessarily a significant impact, depending on whether it is offset by eliminating an existing hazard elsewhere. The City requires mitigation measures to avoid the new wind hazard or the increase in wind hazards.

The Section 148 comfort criteria are not CEQA significance criteria. The comfort criteria are discussed for informational purposes only. The Section 148 comfort criteria are used in this EIR to help inform decision-makers and the public about the comfort, usability and suitability of the proposed open spaces for various uses from a wind perspective.

Note that, in addition to being applicable to specific areas, as identified above, Section 148 criteria normally apply to public areas that are open and accessible to the public, such as sidewalks, streets, as well as public parks and open spaces. Section 148 criteria are not applied to private open spaces, service areas, and non-public areas on project sites.

APPROACH TO ANALYSIS

The wind impact analysis relies upon wind tunnel testing using the Planning Department's standard methodology. The wind tunnel test of the Proposed Project was conducted using a 1:400 (1 inch = 33 feet) scale model of the Proposed Project and surrounding buildings within a 1,600-foot radius from a point approximately 400 feet to the west of the center of the project site.[8] The wind study area extends a little past 19th Street, to the north. To the west, the wind study area includes Illinois, Third, and farther, past Tennessee streets. To the south, it extends almost to Humboldt Street, which is perpendicular to Illinois Street, and which goes east into the former Potrero Power Plant.

The scale model, which was equipped with permanently mounted wind speed sensors, was placed inside an atmospheric boundary layer wind tunnel. Proposed changes in grade were not modeled because the changes were deemed insufficient to affect pedestrian-level wind speeds.[9] Building

[8] "This study area is typical of a wind study, as it includes all buildings that would impact the proposed site." Pedestrian Wind Study, p. 2. In other words, the dimensions of the physical model are sufficiently wide (diameter of the turntable) to include all buildings that would affect winds at the project site.

[9] The area around Building 12 was modeled as flat; therefore, effectively Grading Option 3, where the grade matches surrounding grades. If Grading Option 1 were implemented, the abrupt change in elevation of approximately 4 feet could cause small localized zones of lower wind speeds; this would not be a substantial effect.

massing extending upward to the proposed Height Limits Plan was modeled (further details below); actual architectural designs might give different results in the wind tunnel.

Using four wind directions (NW, WNW, W, WSW), wind tunnel tests were then conducted for the project site and vicinity using the following six different configurations:[10]

- Baseline Conditions Configuration: All existing buildings on the project site,[11] and existing and baseline buildings in the surroundings within a 1,600-foot radius of a point approximately 400 feet to the west of the center of project site;[12]
- Maximum Residential Scenario Configuration: All existing and baseline buildings in the surroundings, on-site rehabilitated buildings to be retained, the maximum heights under the proposed Maximum Heights Plan, and massing of a representative residential building typology on each parcel in the Maximum Residential Scenario;
- Maximum Commercial Scenario Configuration: All existing and baseline buildings in the surroundings, on-site rehabilitated buildings to be retained, the maximum heights under the proposed Maximum Heights Plan,[13] and maximum massing on each parcel in the Maximum Commercial Scenario;
- Maximum Commercial Scenario: Pedestrian Passageway Option Configuration: The same as the Maximum Commercial Scenario Configuration, but with the passageways in the southern portion of the project site configured per the Pedestrian Passageway Option.[14]
- Maximum Residential Scenario plus Cumulative Configuration:[15] The same as the Maximum Residential Scenario Configuration, plus anticipated cumulative development near the project site; and

[10] Pedestrian Wind Study, p. 1 (portions quoted).

[11] "Existing buildings" excludes temporary structures, such as: (a) the storage facility's trailer at the southeast corner of the site and the storage lockers or containers, and (b) the small and large sheds at the Hoedown Yard (some are open-ended). None of these temporary structures are taller than one story.

[12] The following baseline projects are within the wind tunnel study area: 2235 Third Street, 20th Street Historic Core, 851 Tennessee Street, 616 20th Street, and 1201-1225 Tennessee Street. As discussed in the "Approach to Baseline Setting" discussion in Section 4.A, Introduction to Chapter 4, pp. 4.A.5-4.A.12, baseline buildings include projects that were under construction as of the date of the NOP or approved and reasonably likely to be completed and occupied when the Proposed Project is expected to be implemented.

[13] Other wind tunnel modeling details are as follows: The wind tunnel model appropriately used maximum heights under the Pier 70 Maximum Heights Plan; this did not include potential rooftop mechanical equipment (allowed up to 16 feet above the building height). The grade around Building 12 was modeled as the same as surrounding new construction (Option 3). The proposed, new, off-site 20th Street pump station west of Building 6 was not included in the model because at approximately 10 feet in height, it would not have a material effect on pedestrian-level wind speeds.

[14] See "Mid-Block Passages," in Chapter 2, Project Description, pp. 2.42-2.44.

[15] Figure 1a through Figure 1f in the Pedestrian Wind Study show photographs of the physical model used in the wind tunnel test for the configurations studied. See Pedestrian Wind Study, PDF pp. 40 through 45. Image 1 and the table on p. 4 of the Pedestrian Wind Study show the cumulative projects analyzed.

- Maximum Commercial Scenario plus Cumulative Configuration: The same as the Maximum Commercial Scenario Configuration, plus anticipated cumulative development near the project site.

The eight cumulative projects near enough to the site to affect pedestrian-level winds and therefore within the diameter of the physical model evaluated in the wind tunnel are 2177 Third Street, 777 Tennessee Street, 815 – 825 Tennessee Street, 2230 Third Street, 888 Tennessee Street, 2290 Third Street, 901 Tennessee Street, and 2420 Third Street.[16]

The physical model had 248 wind speed sensors (also known as wind sensor test points) to measure mean and gust wind speeds at an equivalent full-scale height of approximately 5 feet above ground. Six of these measurement locations were on the roofs of proposed parking structures, and consequently are not applicable to the Baseline Configuration (test point locations 141, 142, 143, 165, 166, and 167). Twelve of the measurement locations were covered by existing buildings that are planned for demolition (test point locations 121-123, 182, 192, 193, 205-207, 217-219). Therefore, the Baseline Conditions Configuration has 18 fewer wind sensor test points than the other configurations.

The wind tunnel analysis relies on wind data collected from the United States Weather Bureau weather station atop the Federal Building at 50 United Nations Plaza during the six-year period of 1945 to 1950. Wind data from 7:00 a.m. to 6:00 p.m. are used, because this time period represents peak pedestrian activity in a downtown setting.

Section 148 establishes equivalent wind speeds of 7 mph as the comfort criterion for public seating areas. While public open space areas have been designated, the exact locations of public seating and other features within those open spaces are not known. The proposed *Pier 70 SUD Design for Development* provides concepts and approximate hypothetical site plans, but these concepts and site plans are to be further developed. The Pedestrian Wind Study uses the 11-mph comfort criterion, because the public seating locations are subject to change. Table 4.I.1: Wind Comfort Analysis (Criteria Speed = 11 mph) and Table 4.I.2: Wind Hazard Analysis (Criteria Speed = 36 mph), pp. 4.I.17-4.I.26 and pp. 4.I.27-4.I.36, respectively, present the Pedestrian Wind Study results.

[16] See Pedestrian Wind Study, pp. 40-45. Figure 1a through Figure 1f in the Pedestrian Wind Study show photographs of the physical model used in the wind tunnel analysis as modified for the above scenarios. Image 1 and the table on p. 4 of the Pedestrian Wind Study show the cumulative projects analyzed.

PROJECT FEATURES

Building Locations and Maximum Building Heights

The proposed Pier 70 SUD would include amendments to the *General Plan* and Planning Code that would establish the height and bulk district on the project site. The existing height and bulk district on the 28-Acre Site is 40-X; the proposed amendments to the *General Plan* and Planning Code would include an amendment to change the existing 40-X Height and Bulk District to 90-X, except for a 100-foot-wide portion adjacent to the shoreline, which would remain at 40-X. (See Figure 2.13: Proposed Height Limits Plan, in Chapter 2, Project Description, p. 2.40.) Maximum building heights would be generally 50, 65, 70, and 90 feet, depending on location. Buildings up to 90 feet in height could generally be constructed along the southern and northern perimeters. At the center and eastern portions of the site, new buildings would be limited to heights between 50 to 70 feet.

The existing height and bulk districts on the Illinois Parcels are 65-X along the western end of the project site, and 40-X within the eastern portion of the Hoedown Yard. The proposed amendments to the *General Plan* and Planning Code would include an amendment to change the existing 40-X Height and Bulk District to 65-X. Proposed building locations on the 20th/Illinois portion of the site would front Illinois Street and the new 21st Street. Proposed development on the Hoedown Yard would front Illinois Street and the southern property line adjacent to 22nd Street.

Buildings 2 and 12, in the central portion of the 28-Acre Site, would be retained at their existing heights of approximately 80 feet and 60 feet, respectively. Existing Building 21, which is about 45 feet tall, would be moved about 75 feet southeast from its current location to a new site just north of the proposed Slipways Commons open space. Relocated Building 21 would be framed by new 90-foot-tall, 65-foot-tall, and 50-foot-tall buildings to the west, north, and east, respectively.

Proposed Open Space Plan

The Proposed Project would construct 9 acres of publicly owned open space. (See Figure 2.15: Proposed Open Space Plan, in Chapter 2, Project Description, p. 2.15.) Open spaces included as part of the Proposed Project under both the Maximum Residential and Maximum Commercial scenarios would be the Waterfront Terrace, Waterfront Promenade, Slipways Commons, Building 12 Market Plaza and Market Square, Irish Hill Playground, and 20th Street Plaza. If parking is developed on Parcels C1 and/or C2, public open space would be built on the building rooftops.

These open spaces are described below; they are not yet fully programmed. The conceptual ideas for activities and improvements at these locations are summarized below, under "Public Open Spaces within the Project Site," p. 4.I.47, and further elaborated under "Project Features," p. 4.I.75, and "Proposed Open Space Plan" in the Shadows subsection of this EIR section, p. 4.I.76.

Pedestrian Passageway Option

A Maximum Residential Scenario and a Maximum Commercial Scenario are evaluated in this EIR. The approximate location of pedestrian and service passageways is shown in Figure 2.14: Mid-Block Passageway Locations, in Chapter 2, Project Description, p. 2.43. Since design details for these pedestrian building connectors between Parcels HDY1 and HDY2, Parcels F and G, and Parcels H1 and H2 these passageways are not decided, the wind tunnel study evaluates three different pedestrian passageways options in order to fully analyze wind conditions along the southern parcels. Under the Maximum Residential Scenario, the building connectors would be 40 feet wide and fully open to the sky. Under the Maximum Commercial Scenario, building connectors would also be 40 feet wide and allow for exposure to the sky in accordance with the *Pier 70 SUD Design for Development* setback requirements. Under the Pedestrian Passageway Option, the mid-block passageway remains 40 feet wide. An above-ground building connection would be allowed and would be required to have at least 60 percent of the overhead area exposed directly to the sky. A comparison of the pedestrian passageway options is shown in Figure 4.I.1: Pedestrian Passageway Connector Options along Southern Parcels.

WIND TUNNEL TEST RESULTS

Wind tunnel testing was conducted for the Proposed Project. Tests were performed for the baseline condition and for the Proposed Project at full build-out. Figure 4.I.2: Pedestrian Wind Comfort and Hazard Conditions – Baseline Conditions, p. 4.I.15, shows the wind tunnel test points for the baseline conditions. Table 4.I.1: Wind Comfort Analysis (Criteria Speed = 11 mph) presents the analysis results for the measured equivalent wind speeds that were exceeded 10 percent of the time for each test location and test scenario and the percentage of time that the wind speed would exceed the pedestrian comfort criterion.[17] Table 4.I.2: Wind Hazard Analysis (Criteria Speed = 36 mph) presents the wind hazard analysis results, the equivalent wind speed, and the number of hours per year that the hazard criterion would be exceeded for each test location and test scenario. This analysis compares baseline wind conditions and conditions with the Proposed Project at full build-out, based on the measured winds at the test point locations. For the wind tunnel test, the physical model was based on maximum heights under the Pier 70

[17] Although neither the Section 148 pedestrian comfort criterion nor the seating comfort criterion is used as a CEQA significance threshold, the analysis and discussion of the comfort criterion provides a basis for evaluating the comfort and usability of pedestrian areas and open spaces.

Height Limits Plan and a representative residential building typology for the Maximum Residential Scenario. The physical model for the Maximum Commercial Scenario and Pedestrian Passageway Option were based on maximum heights under the Pier 70 Heights Plan and maximum commercial massing. For the 28-Acre Site, maximum building heights would be generally 50, 65, 70, and 90 feet, depending on location. Buildings up to 90 feet in height could generally be constructed along the southern and northern perimeters. At the center and eastern portions of the site, new buildings would be limited to heights between 50 to 70 feet. The maximum building heights on the Illinois Parcels would be 65 feet. See Figure 2.13: Proposed Height Limits Plan on p. 2.40.

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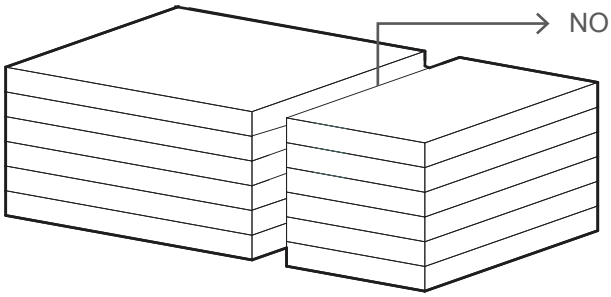
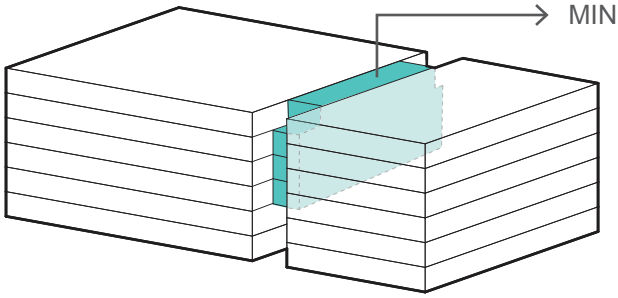
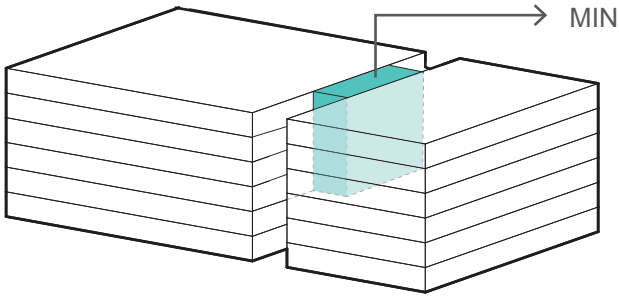


Maximum Residential Scenario



Maximum Commercial Scenario



Pedestrian Passageway Option

Source: Forest City (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.I.1: PEDESTRIAN PASSAGEWAY CONNECTOR OPTIONS ALONG SOUTHERN PARCELS

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Source: RWDI, Pier 70 Mixed Use District Project EIR; Final Report: Pedestrian Wind Study, Wind Tunnel Tests, Figures 2a and 3a, November 30, 2015.

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.I.2: PEDESTRIAN WIND COMFORT AND HAZARD CONDITIONS – BASELINE CONDITIONS

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Table 4.I.1: Wind Comfort Analysis (Criteria Speed = 11 mph)

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
1	14	21	e	14	23	0	e	13	20	-1	e	11	10	-3		14	21	0	e	14	22	0	e	
2	14	24	e	15	26	1	e	14	22	0	e	11	10	-3		14	22	0	e	15	26	1	e	
3	10	6		10	4	0		12	17	2	e	10	5	0		12	15	2	e	10	6	0		
4	12	18	e	13	19	1	e	15	26	3	e	12	15	0	e	15	25	3	e	13	19	1	e	
5	13	20	e	13	19	0	e	18	40	5	e	14	22	1	e	18	40	5	e	13	20	0	e	
6	12	15	e	12	17	0	e	12	12	0	e	11	10	-1		13	19	1	e	12	17	0	e	
7	16	32	e	16	31	0	e	13	18	-3	e	16	32	0	e	13	18	-3	e	16	32	0	e	
8	16	29	e	16	30	0	e	14	22	-2	e	16	29	0	e	14	22	-2	e	16	31	0	e	
9	14	24	e	14	24	0	e	11	10	-3		13	21	-1	e	11	10	-3		14	25	0	e	
10	16	33	e	16	33	0	e	13	21	-3	e	16	31	0	e	14	22	-2	e	16	33	0	e	
11	13	21	e	13	21	0	e	13	18	0	e	13	21	0	e	13	19	0	e	13	21	0	e	
12	13	18	e	13	18	0	e	11	10	-2		12	17	-1	e	12	14	-1	e	13	19	0	e	
13	13	19	e	13	17	0	e	13	21	0	e	13	19	0	e	14	22	1	e	13	20	0	e	
14	8	1		8	1	0		9	2	1		8	2	0		9	2	1		8	1	0		
15	13	18	e	13	18	0	e	12	15	-1	e	13	18	0	e	12	16	-1	e	13	18	0	e	
16	8	1		8	2	0		8	1	0		9	2	1		8	1	0		8	2	0		
17	12	12	e	12	13	0	e	12	12	0	e	12	13	0	e	12	13	0	e	11	10	-1		
18	10	7		10	6	0		10	6	0		10	5	0		10	7	0		10	6	0		
19	11	10		11	10	0		11	10	0		11	10	0		11	10	0		11	10	0		
20	12	18	e	12	18	0	e	13	19	1	e	13	18	1	e	13	20	1	e	13	19	1	e	
21	9	4		10	4	1		9	4	0		9	4	0		10	5	1		9	4	0		
22	12	16	e	12	14	0	e	12	13	0	e	12	13	0	e	12	16	0	e	12	15	0	e	
23	17	34	e	16	32	-1	e	16	32	-1	e	16	32	-1	e	16	34	-1	e	16	33	-1	e	
24	13	18	e	12	17	-1	e	12	18	-1	e	12	17	-1	e	13	19	0	e	12	17	-1	e	
25	10	6		10	5	0		10	4	0		10	4	0		10	4	0		9	4	-1		

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
26	8	3		8	3	0		8	3	0		8	3	0		8	3	0		9	4	1		
27	14	19	e	15	22	1	e	15	25	1	e	15	25	1	e	15	26	1	e	16	27	2	e	
28	6	0		9	3	3		8	3	2		9	3	3		9	5	3		9	4	3		
29	6	0		10	5	4		10	5	4		10	4	4		10	5	4		10	5	4		
30	6	0		9	5	3		9	4	3		9	4	3		10	5	4		10	5	4		
31	6	0		8	2	2		8	2	2		8	2	2		8	2	2		8	2	2		
32	8	1		8	1	0		8	2	0		8	2	0		8	2	0		8	2	0		
33	16	28	e	15	27	-1	e	10	8	-6		15	25	-1	e	10	7	-6		16	29	0	e	
34	16	29	e	14	21	-2	e	12	13	-4	e	14	20	-2	e	12	14	-4	e	15	23	-1	e	
35	9	3		9	3	0		9	2	0		9	2	0		9	3	0		9	2	0		
36	9	4		9	4	0		10	4	1		9	4	0		9	4	0		9	4	0		
37	7	1		8	2	1		8	2	1		8	2	1		8	2	1		8	2	1		
38	18	40	e	19	43	1	e	13	15	-5	e	15	26	-3	e	12	13	-6	e	15	26	-3	e	
39	10	6		9	5	-1		9	4	-1		9	4	-1		9	4	-1		10	5	0		
40	11	10		10	7	-1		9	5	-2		10	7	-1		9	5	-2		10	7	-1		
41	13	16	e	12	15	-1	e	11	10	-2		13	15	0	e	11	10	-2		13	15	0	e	
42	11	10		12	13	1	e	12	15	1	e	11	10	0		12	14	1	e	12	12	1	e	
43	10	7		10	6	0		10	5	0		10	6	0		9	5	-1		10	6	0		
44	12	12	e	11	10	-1		10	6	-2		11	10	-1		9	4	-3		11	10	-1		
45	13	18	e	12	17	-1	e	12	15	-1	e	12	16	-1	e	12	15	-1	e	12	17	-1	e	
46	14	20	e	13	17	-1	e	13	17	-1	e	13	16	-1	e	13	18	-1	e	13	16	-1	e	
47	10	6		9	3	-1		9	4	-1		9	4	-1		9	4	-1		9	3	-1		
48	14	22	e	13	19	-1	e	13	16	-1	e	13	19	-1	e	13	16	-1	e	13	18	-1	e	
49	14	21	e	13	17	-1	e	13	16	-1	e	13	17	-1	e	13	16	-1	e	13	17	-1	e	
50	9	6		9	4	0		9	4	0		9	5	0		9	4	0		9	5	0		
51	12	13	e	11	10	-1		11	10	-1		11	10	-1		11	10	-1		11	10	-1		
52	19	45	e	18	41	-1	e	18	37	-1	e	18	40	-1	e	18	38	-1	e	18	40	-1	e	

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
53	11	10		9	3	-2		9	5	-2		9	4	-2		9	4	-2		9	4	-2		
54	20	48	e	16	30	-4	e	18	41	-2	e	21	51	1	e	19	44	-1	e	18	41	-2	e	
55	13	14	e	11	10	-2		11	10	-2		11	10	-2		11	10	-2		11	10	-2		
56	17	36	e	17	38	0	e	18	39	1	e	18	38	1	e	17	36	0	e	18	38	1	e	
57	12	15	e	10	5	-2		10	5	-2		10	5	-2		10	5	-2		10	6	-2		
58	14	24	e	14	24	0	e	14	24	0	e	14	24	0	e	14	23	0	e	14	24	0	e	
59	8	2		7	0	-1		7	0	-1		7	0	-1		6	0	-2		7	0	-1		
60	11	10		12	14	1	e	12	14	1	e	12	14	1	e	12	13	1	e	12	13	1	e	
61	12	14	e	11	10	-1		11	10	-1		11	10	-1		11	10	-1		11	10	-1		
62	15	28	e	14	24	-1	e	15	26	0	e	15	25	0	e	14	25	-1	e	15	25	0	e	
63	15	27	e	14	21	-1	e	14	22	-1	e	14	22	-1	e	13	21	-2	e	14	23	-1	e	
64	15	23	e	15	24	0	e	15	25	0	e	15	24	0	e	15	24	0	e	15	25	0	e	
65	15	28	e	16	29	1	e	16	29	1	e	16	30	1	e	16	29	1	e	16	29	1	e	
66	15	26	e	15	27	0	e	15	27	0	e	15	27	0	e	15	26	0	e	15	27	0	e	
67	15	28	e	16	29	1	e	16	30	1	e	16	29	1	e	16	28	1	e	16	29	1	e	
68	9	4		9	3	0		9	4	0		9	4	0		9	3	0		9	4	0		
69	8	2		8	3	0		9	3	1		8	3	0		9	3	1		9	3	1		
70	11	10		12	12	1	e	12	11	1	e	12	12	1	e	12	11	1	e	12	12	1	e	Waterfront Terrace
71	18	42	e	19	44	1	e	19	45	1	e	19	45	1	e	18	43	0	e	18	43	0	e	Waterfront Terrace
72	14	26	e	14	18	0	e	14	18	0	e	13	17	-1	e	14	18	0	e	13	17	-1	e	
73	16	31	e	16	30	0	e	17	30	1	e	16	30	0	e	16	30	0	e	16	30	0	e	
74	17	37	e	13	15	-4	e	13	14	-4	e	12	14	-5	e	12	14	-5	e	12	15	-5	e	
75	15	30	e	14	20	-1	e	14	20	-1	e	14	19	-1	e	14	19	-1	e	14	20	-1	e	Waterfront Terrace
76	17	37	e	12	18	-5	e	13	17	-4	e	13	17	-4	e	12	16	-5	e	13	18	-4	e	Waterfront Terrace
77	18	39	e	13	15	-5	e	13	16	-5	e	13	15	-5	e	13	15	-5	e	13	15	-5	e	Waterfront Terrace
78	15	27	e	9	5	-6		9	5	-6		9	6	-6		9	4	-6		9	5	-6		Waterfront Terrace
79	16	33	e	9	2	-7		8	2	-8		9	2	-7		8	2	-8		8	2	-8		Waterfront Terrace

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
80	15	29	e	8	1	-7		7	1	-8		7	0	-8		7	0	-8		8	1	-7		
81	16	30	e	7	0	-9		7	0	-9		6	0	-10		6	0	-10		7	0	-9		
82	14	23	e	8	3	-6		8	3	-6		8	3	-6		8	3	-6		8	3	-6		
83	11	10		7	1	-4		7	1	-4		7	1	-4		7	1	-4		7	1	-4		
84	15	24	e	13	16	-2	e	13	16	-2	e	13	15	-2	e	13	15	-2	e	13	16	-2	e	
85	9	2		13	14	4	e	13	14	4	e	13	14	4	e	13	14	4	e	13	14	4	e	
86	13	20	e	16	21	3	e	16	21	3	e	16	22	3	e	16	20	3	e	16	22	3	e	
87	13	18	e	16	29	3	e	16	28	3	e	16	29	3	e	16	29	3	e	16	29	3	e	
88	14	21	e	14	18	0	e	15	19	1	e	15	19	1	e	14	18	0	e	15	19	1	e	
89	15	26	e	10	8	-5		11	10	-4		11	10	-4		10	8	-5		11	10	-4		
90	14	23	e	12	13	-2	e	12	12	-2	e	11	10	-3		11	10	-3		12	12	-2	e	
91	12	15	e	10	7	-2		10	7	-2		10	6	-2		10	6	-2		10	6	-2		
92	16	29	e	14	22	-2	e	14	21	-2	e	14	22	-2	e	13	21	-3	e	14	21	-2	e	Building 12 Market Plaza and Market Square
93	16	32	e	15	27	-1	e	15	26	-1	e	15	26	-1	e	15	26	-1	e	15	27	-1	e	
94	16	31	e	14	25	-2	e	15	24	-1	e	14	24	-2	e	14	23	-2	e	14	23	-2	e	
95	9	2		15	26	6	e	15	27	6	e	15	26	6	e	15	27	6	e	15	25	6	e	
96	13	18	e	16	29	3	e	16	28	3	e	16	28	3	e	16	29	3	e	16	28	3	e	
97	14	25	e	13	20	-1	e	13	19	-1	e	13	20	-1	e	13	20	-1	e	13	20	-1	e	
98	15	26	e	13	19	-2	e	13	19	-2	e	13	18	-2	e	13	19	-2	e	13	19	-2	e	
99	15	27	e	11	10	-4		12	12	-3	e	12	12	-3	e	12	13	-3	e	12	13	-3	e	
100	13	17	e	11	10	-2		11	10	-2		11	10	-2		11	10	-2		11	10	-2		
101	12	13	e	11	10	-1		11	10	-1		11	10	-1		11	10	-1		11	10	-1		
102	12	15	e	12	13	0	e	12	12	0	e	12	13	0	e	11	10	-1		12	13	0	e	
103	13	20	e	11	10	-2		12	12	-1	e	11	10	-2		12	12	-1	e	11	10	-2		
104	12	15	e	14	20	2	e	14	23	2	e	13	19	1	e	14	22	2	e	14	21	2	e	
105	14	24	e	12	14	-2	e	12	14	-2	e	12	14	-2	e	12	15	-2	e	12	15	-2	e	

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
106	10	6		9	4	-1		9	4	-1		10	4	0		10	5	0		10	5	0		
107	9	3		9	3	0		9	3	0		9	3	0		9	3	0		9	4	0		
108	13	19	e	8	1	-5		8	1	-5		8	1	-5		8	1	-5		8	1	-5		
109	12	14	e	9	4	-3		9	4	-3		9	4	-3		9	4	-3		9	3	-3		
110	10	7		12	13	2	e	12	13	2	e	12	13	2	e	12	13	2	e	12	13	2	e	20th Street Plaza
111	11	10		9	5	-2		8	3	-3		9	5	-2		8	4	-3		9	6	-2		20th Street Plaza
112	12	11	e	12	13	0	e	11	10	-1		12	13	0	e	11	10	-1		12	14	0	e	20th Street Plaza
113	10	4		9	5	-1		10	7	0		9	4	-1		10	7	0		10	6	0		20th Street Plaza
114	9	4		11	10	2		10	6	1		10	7	1		10	6	1		11	10	2		20th Street Plaza
115	16	30	e	14	23	-2	e	11	10	-5		14	22	-2	e	11	10	-5		15	24	-1	e	20th Street Plaza
116	11	10		8	1	-3		9	3	-2		9	3	-2		9	3	-2		9	3	-2		
117	12	12	e	11	10	-1		10	7	-2		11	10	-1		10	8	-2		11	10	-1		
118	9	5		11	10	2		11	10	2		11	10	2		11	10	2		11	10	2		
119	11	10		10	8	-1		10	5	-1		10	8	-1		10	6	-1		11	10	0		
120	11	10		10	8	-1		10	6	-1		11	10	0		10	6	-1		11	10	0		
121	Data not available			14	22	N/A	e	14	22	N/A	e	14	23	N/A	e	14	23	N/A	e	14	24	N/A	e	
122				11	10			11	10			12	12		e	11	10			12	13		e	
123				14	21		e	13	21		e	14	23		e	14	22		e	14	24		e	
124	8	3		7	0	-1		7	0	-1		7	0	-1		7	0	-1		7	0	-1		
125	9	4		8	1	-1		8	1	-1		8	1	-1		8	1	-1		8	1	-1		
126	13	18	e	12	14	-1	e	11	10	-2		11	10	-2		11	10	-2		11	10	-2		
127	16	31	e	13	22	-3	e	14	21	-2	e	13	20	-3	e	14	22	-2	e	13	21	-3	e	
128	15	26	e	14	24	-1	e	14	22	-1	e	14	22	-1	e	14	22	-1	e	14	23	-1	e	
129	14	21	e	12	15	-2	e	12	15	-2	e	11	10	-3		12	14	-2	e	12	14	-2	e	
130	15	28	e	14	22	-1	e	13	21	-2	e	13	20	-2	e	13	21	-2	e	13	21	-2	e	
131	13	18	e	11	10	-2		10	8	-3		11	10	-2		11	10	-2		12	13	-1	e	
132	16	29	e	13	19	-3	e	13	18	-3	e	13	17	-3	e	13	18	-3	e	13	19	-3	e	

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
133	15	29	e	10	6	-5		10	5	-5		10	6	-5		10	6	-5		10	6	-5		
134	15	24	e	17	33	2	e	16	32	1	e	17	32	2	e	16	31	1	e	17	33	2	e	
135	15	27	e	14	24	-1	e	14	24	-1	e	14	24	-1	e	14	23	-1	e	15	25	0	e	
136	14	25	e	10	5	-4		10	5	-4		10	5	-4		10	5	-4		10	5	-4		
137	10	6		12	16	2	e	12	16	2	e	12	16	2	e	12	16	2	e	12	15	2	e	Irish Hill Playground
138	10	8		11	10	1		11	10	1		11	10	1		11	10	1		11	10	1		Irish Hill Playground
139	11	10		5	0	-6		5	0	-6		5	0	-6		5	0	-6		5	0	-6		Irish Hill Playground
140	6	0		4	0	-2		4	0	-2		4	0	-2		4	0	-2		4	0	-2		Irish Hill Playground
141	Data not available			19	47	N/A	e	19	47	N/A	e	19	47	N/A	e	19	47	N/A	e	19	47	N/A	e	
142				19	46		e	19	45		e	19	46		e	19	46		e	19	47		e	
143				20	47		e	19	46		e	20	47		e	19	47		e	20	48		e	
144	12	13	e	9	4	-3		9	2	-3		9	4	-3		9	3	-3		9	4	-3		Irish Hill Playground
145	12	12	e	10	7	-2		10	6	-2		11	10	-1		10	6	-2		11	10	-1		Irish Hill Playground
146	12	13	e	10	5	-2		9	4	-3		10	5	-2		10	6	-2		10	6	-2		Irish Hill Playground
147	10	8		10	7	0		10	7	0		10	6	0		10	7	0		10	7	0		Irish Hill Playground
148	9	5		9	4	0		9	4	0		9	5	0		9	5	0		9	5	0		
149	9	4		11	10	2		11	10	2		11	10	2		12	13	3	e	11	10	2		Irish Hill Playground
150	9	4		9	4	0		9	3	0		9	3	0		9	3	0		9	4	0		
151	11	10		13	15	2	e	13	15	2	e	13	16	2	e	14	17	3	e	13	16	2	e	
152	12	16	e	14	22	2	e	14	23	2	e	14	22	2	e	14	24	2	e	14	23	2	e	
153	13	14	e	12	12	-1	e	12	13	-1	e	12	12	-1	e	12	12	-1	e	13	13	0	e	
154	10	9		7	0	-3		7	0	-3		7	0	-3		7	0	-3		7	0	-3		
155	12	12	e	11	10	-1		11	10	-1		8	1	-4		9	2	-3		8	1	-4		
156	12	12	e	11	10	-1		12	12	0	e	8	2	-4		9	2	-3		8	2	-4		
157	12	12	e	10	5	-2		10	6	-2		9	4	-3		9	5	-3		11	10	-1		
158	12	16	e	11	10	-1		11	10	-1		10	6	-2		10	7	-2		10	6	-2		Irish Hill Playground
159	11	10		10	6	-1		10	6	-1		10	7	-1		11	10	0		10	6	-1		Irish Hill Playground

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
160	6	0		7	0	1		7	0	1		7	0	1		7	0	1		7	1	1		Irish Hill Playground
161	12	14	e	10	8	-2		10	7	-2		10	8	-2		10	7	-2		11	10	-1		Irish Hill Playground
162	14	23	e	10	6	-4		10	6	-4		10	6	-4		10	6	-4		10	6	-4		Irish Hill Playground
163	15	29	e	13	18	-2	e	13	17	-2	e	13	17	-2	e	13	18	-2	e	14	22	-1	e	Irish Hill Playground
164	9	4		13	18	4	e	12	17	3	e	13	20	4	e	13	20	4	e	13	20	4	e	Irish Hill Playground
165	Data not available			14	23	N/A	e	14	22	N/A	e	14	23	N/A	e	14	23	N/A	e	14	23	N/A	e	
166				19	42		e	18	42		e	19	42		e	19	42		e	19	42		e	
167				16	33		e	17	35		e	17	37		e	18	38		e	17	36		e	
168	8	2		13	21	5	e	13	20	5	e	13	20	5	e	13	21	5	e	13	20	5	e	Irish Hill Playground
169	14	23	e	9	2	-5		8	1	-6		10	4	-4		10	6	-4		10	5	-4		
170	11	10		7	0	-4		7	0	-4		8	1	-3		8	1	-3		8	1	-3		
171	18	40	e	8	1	-10		7	0	-11		9	3	-9		9	3	-9		17	34	-1	e	
172	13	17	e	10	6	-3		10	6	-3		10	5	-3		10	7	-3		10	6	-3		
173	12	13	e	10	7	-2		11	10	-1		10	5	-2		9	4	-3		10	4	-2		
174	4	0		9	5	5		9	4	5		14	23	10	e	14	23	10	e	14	23	10	e	
175	12	14	e	11	10	-1		11	10	-1		12	17	0	e	13	18	1	e	12	15	0	e	
176	15	24	e	13	18	-2	e	13	17	-2	e	9	5	-6		9	4	-6		9	6	-6		
177	14	24	e	11	10	-3		11	10	-3		11	10	-3		11	10	-3		11	10	-3		
178	16	31	e	14	24	-2	e	14	24	-2	e	14	24	-2	e	14	24	-2	e	14	24	-2	e	
179	16	30	e	12	14	-4	e	12	15	-4	e	12	17	-4	e	12	15	-4	e	12	17	-4	e	
180	18	38	e	12	13	-6	e	11	10	-7		10	7	-8		10	6	-8		10	7	-8		Building 12 Market Plaza and Market Square
181	17	36	e	10	7	-7		10	6	-7		10	8	-7		11	10	-6		11	10	-6		
182	Data not available			11	10	N/A		10	7	N/A		10	7	N/A		10	7	N/A		11	10	N/A		
183	17	34	e	7	1	-10		8	1	-9		Data not available				Data not available				10	6	-7		
184	14	23	e	9	3	-5		9	3	-5		9	2	-5		9	3	-5		6	0	-8		
185	19	44	e	13	20	-6	e	13	19	-6	e	15	26	-4	e	15	28	-4	e	13	19	-6	e	

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
186	17	37	e	17	34	0	e	16	33	-1	e	14	23	-3	e	14	25	-3	e	14	25	-3	e	
187	14	24	e	8	1	-6		7	0	-7		8	1	-6		8	1	-6		8	1	-6		
188	17	37	e	14	17	-3	e	13	17	-4	e	12	15	-5	e	13	17	-4	e	13	17	-4	e	
189	11	10		12	14	1	e	12	14	1	e	12	12	1	e	12	12	1	e	12	13	1	e	
190	11	10		12	13	1	e	12	12	1	e	11	10	0		11	10	0		11	10	0		
191	8	2		12	12	4	e	12	12	4	e	12	12	4	e	12	12	4	e	12	12	4	e	
192	Data not available			10	6			9	5	N/A		9	4	N/A		8	3	N/A		9	6	N/A		
193	Data not available			9	4	N/A		9	3	N/A		9	4	N/A		9	4	N/A		9	5	N/A		
194	5	0		10	5	5		9	4	4		10	5	5		9	5	4		10	6	5		Building 12 Market Plaza and Market Square
195	10	6		12	15	2	e	12	15	2	e	12	14	2	e	12	15	2	e	12	14	2	e	
196	9	5		9	3	0		9	2	0		9	3	0		9	3	0		9	3	0		
197	6	0		8	1	2		8	1	2		8	1	2		8	1	2		8	1	2		Building 12 Market Plaza and Market Square
198	7	0		9	3	2		9	2	2		9	3	2		9	3	2		9	3	2		Building 12 Market Plaza and Market Square
199	18	36	e	9	4	-9		9	4	-9		9	4	-9		9	2	-9		9	3	-9		Building 12 Market Plaza and Market Square
200	14	23	e	8	1	-6		8	1	-6		8	1	-6		8	1	-6		8	1	-6		Building 12 Market Plaza and Market Square
201	16	29	e	13	16	-3	e	13	17	-3	e	13	16	-3	e	13	17	-3	e	13	16	-3	e	Building 12 Market Plaza and Market Square
202	15	28	e	14	19	-1	e	14	20	-1	e	14	19	-1	e	14	20	-1	e	13	19	-2	e	Building 12 Market Plaza and Market Square
203	12	13	e	12	15	0	e	12	15	0	e	12	15	0	e	12	15	0	e	12	13	0	e	Building 12 Market Plaza and Market Square
204	17	34	e	10	6	-7		10	7	-7		10	6	-7		10	7	-7		10	6	-7		Building 12 Market Plaza and Market Square
205	Data not available			9	4	N/A		9	4	N/A		9	3	N/A		10	4	N/A		9	3	N/A		
206				9	4			9	4			9	4			9	3			9	5			

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
207				9	5			9	4			10	5			10	5			10	5			
208	12	14	e	10	7	-2		10	7	-2		10	6	-2		10	6	-2		10	7	-2		Slipways Commons
209	13	14	e	10	7	-3		10	6	-3		10	6	-3		10	6	-3		10	6	-3		Slipways Commons
210	9	3		11	10	2		11	10	2		11	10	2		11	10	2		11	10	2		Slipways Commons
211	13	14	e	10	7	-3		10	7	-3		10	7	-3		10	6	-3		10	5	-3		Slipways Commons
212	14	22	e	9	2	-5		9	2	-5		9	2	-5		9	2	-5		9	2	-5		Slipways Commons
213	14	24	e	8	1	-6		8	1	-6		8	1	-6		8	1	-6		8	1	-6		Slipways Commons
214	15	21	e	10	9	-5		10	8	-5		11	10	-4		10	9	-5		11	10	-4		Slipways Commons
215	14	22	e	12	14	-2	e	12	13	-2	e	12	14	-2	e	12	14	-2	e	12	13	-2	e	Slipways Commons
216	14	23	e	10	6	-4		10	6	-4		10	6	-4		10	6	-4		10	6	-4		Slipways Commons
217	Data not available			10	5	N/A		10	6	N/A		10	6	N/A		10	6	N/A		10	6	N/A		
218				8	1			8	1			8	1			8	1			8	1			
219				5	0			5	0			5	0			5	0			5	0			
220	14	23	e	11	10	-3		11	10	-3		11	10	-3		11	10	-3		11	10	-3		Slipways Commons
221	16	31	e	14	26	-2	e	14	25	-2	e	14	25	-2	e	15	26	-1	e	14	26	-2	e	Slipways Commons
222	15	27	e	11	10	-4		11	10	-4		11	10	-4		11	10	-4		11	10	-4		Slipways Commons
223	14	24	e	6	0	-8		6	0	-8		6	0	-8		6	0	-8		6	0	-8		Waterfront Terrace
224	16	33	e	10	7	-6		10	6	-6		10	7	-6		10	6	-6		10	7	-6		Waterfront Terrace
225	16	34	e	14	23	-2	e	14	24	-2	e	14	23	-2	e	14	23	-2	e	14	23	-2	e	Slipways Commons
226	18	39	e	15	26	-3	e	15	27	-3	e	15	26	-3	e	15	27	-3	e	15	27	-3	e	Slipways Commons
227	17	38	e	15	27	-2	e	15	28	-2	e	15	26	-2	e	15	27	-2	e	15	27	-2	e	Waterfront Promenade
228	16	30	e	12	14	-4	e	12	14	-4	e	12	14	-4	e	12	14	-4	e	12	13	-4	e	Slipways Commons
229	14	23	e	13	15	-1	e	12	14	-2	e	13	16	-1	e	13	16	-1	e	13	16	-1	e	Slipways Commons
230	15	27	e	11	10	-4		11	10	-4		11	10	-4		11	10	-4		11	10	-4		Slipways Commons
231	15	24	e	14	22	-1	e	14	22	-1	e	14	22	-1	e	14	22	-1	e	14	22	-1	e	
232	14	25	e	12	12	-2	e	12	11	-2	e	11	10	-3		10	8	-4		11	10	-3		
233	12	14	e	10	6	-2		10	6	-2		9	6	-3		10	6	-2		9	6	-3		

Table 4.I.1 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of the Time (mph)	Percent of Time Wind Speed Exceeds Criterion Speed	Speed Change Relative to Existing (mph)	Exceeds	Pier 70 Project Open Space Network Areas
234	15	28	e	12	13	-3	e	12	12	-3	e	11	10	-4		11	10	-4		11	10	-4		
235	17	37	e	9	4	-8		9	4	-8		12	12	-5	e	12	11	-5	e	11	10	-6		
236	15	26	e	12	14	-3	e	12	13	-3	e	10	7	-5		10	8	-5		10	6	-5		
237	17	35	e	11	10	-6		11	10	-6		11	10	-6		12	12	-5	e	11	10	-6		
238	18	41	e	13	16	-5	e	12	15	-6	e	13	15	-5	e	13	16	-5	e	13	16	-5	e	
239	18	40	e	10	7	-8		10	7	-8		9	3	-9		9	3	-9		9	4	-9		Waterfront Promenade
240	17	34	e	8	1	-9		8	0	-9		8	1	-9		8	1	-9		8	1	-9		Waterfront Promenade
241	16	33	e	12	12	-4	e	12	14	-4	e	12	15	-4	e	13	17	-3	e	12	13	-4	e	
242	17	35	e	11	10	-6		11	10	-6		11	10	-6		11	10	-6		11	10	-6		
243	18	39	e	13	15	-5	e	13	15	-5	e	13	17	-5	e	13	18	-5	e	12	14	-6	e	Waterfront Promenade
244	17	36	e	11	10	-6		11	10	-6		12	13	-5	e	11	10	-6		12	13	-5	e	Waterfront Promenade
245	15	26	e	9	5	-6		9	4	-6		12	13	-3	e	12	13	-3	e	12	12	-3	e	Waterfront Promenade
246	18	43	e	12	16	-6	e	12	16	-6	e	13	19	-5	e	13	18	-5	e	12	17	-6	e	Waterfront Promenade
247	14	22	e	10	5	-4		10	5	-4		9	3	-5		9	2	-5		9	4	-5		Waterfront Promenade
248	18	40	e	12	13	-6	e	12	14	-6	e	11	10	-7		11	10	-7		12	13	-6	e	Waterfront Promenade
Average speed, Average percent exceedance, Total exceedances	**13 mph**	**19%**	**162 of 230**	**11 mph**	**13%**	**-2 mph**	**119 of 248**	**11 mph**	**12%**	**-2 mph**	**115 of 248**	**11 mph**	**13%**	**-2 mph**	**112 of 247**	**11 mph**	**13%**	**-2 mph**	**113 of 247**	**12 mph**	**13%**	**-1 mph**	**119 of 247**	

Notes: Green = public space; “e” = Exceeds; hr = hour; mph = miles per hour.

Table 4.I.2: Wind Hazard Analysis (Criteria Speed = 36 mph)

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
1	24	0		25	0	0		24	0	0		20	0	0		25	0	0		25	0	0		
2	25	0		27	0	0		24	0	0		19	0	0		24	0	0		27	0	0		
3	18	0		17	0	0		23	0	0		18	0	0		22	0	0		18	0	0		
4	23	0		23	0	0		29	0	0		22	0	0		29	0	0		23	0	0		
5	25	0		25	0	0		34	0	0		25	0	0		33	0	0		25	0	0		
6	22	0		23	0	0		22	0	0		21	0	0		23	0	0		23	0	0		
7	30	0		30	0	0		24	0	0		30	0	0		25	0	0		31	0	0		
8	28	0		28	0	0		24	0	0		28	0	0		24	0	0		29	0	0		
9	25	0		25	0	0		19	0	0		24	0	0		20	0	0		24	0	0		
10	29	0		29	0	0		24	0	0		29	0	0		24	0	0		29	0	0		
11	24	0		24	0	0		23	0	0		23	0	0		23	0	0		24	0	0		
12	22	0		22	0	0		21	0	0		22	0	0		21	0	0		22	0	0		
13	24	0		24	0	0		25	0	0		24	0	0		26	0	0		24	0	0		
14	14	0		14	0	0		15	0	0		15	0	0		16	0	0		13	0	0		
15	22	0		23	0	0		21	0	0		22	0	0		21	0	0		23	0	0		
16	15	0		16	0	0		15	0	0		16	0	0		16	0	0		16	0	0		
17	20	0		21	0	0		20	0	0		21	0	0		21	0	0		21	0	0		
18	18	0		17	0	0		17	0	0		17	0	0		18	0	0		18	0	0		
19	19	0		18	0	0		19	0	0		19	0	0		19	0	0		19	0	0		
20	23	0		22	0	0		24	0	0		25	0	0		25	0	0		25	0	0		
21	17	0		17	0	0		18	0	0		17	0	0		18	0	0		17	0	0		
22	22	0		21	0	0		21	0	0		22	0	0		22	0	0		23	0	0		
23	30	0		29	0	0		28	0	0		29	0	0		30	0	0		29	0	0		
24	23	0		22	0	0		22	0	0		22	0	0		23	0	0		22	0	0		
25	19	0		18	0	0		18	0	0		18	0	0		18	0	0		18	0	0		
26	20	0		20	0	0		20	0	0		20	0	0		20	0	0		20	0	0		

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
27	30	0		31	0	0		31	0	0		31	0	0		31	0	0		32	0	0		
28	13	0		17	0	0		18	0	0		18	0	0		19	0	0		18	0	0		
29	14	0		19	0	0		19	0	0		18	0	0		19	0	0		19	0	0		
30	12	0		19	0	0		18	0	0		18	0	0		19	0	0		19	0	0		
31	14	0		17	0	0		17	0	0		17	0	0		18	0	0		17	0	0		
32	16	0		16	0	0		17	0	0		16	0	0		18	0	0		16	0	0		
33	29	0		29	0	0		18	0	0		27	0	0		18	0	0		29	0	0		
34	34	0		30	0	0		27	0	0		29	0	0		28	0	0		30	0	0		
35	17	0		17	0	0		16	0	0		17	0	0		16	0	0		17	0	0		
36	20	0		20	0	0		18	0	0		20	0	0		19	0	0		20	0	0		
37	16	0		17	0	0		17	0	0		17	0	0		17	0	0		17	0	0		
38	35	0		36	0	0		25	0	0		29	0	0		23	0	0		29	0	0		
39	18	0		18	0	0		18	0	0		17	0	0		18	0	0		18	0	0		
40	21	0		20	0	0		19	0	0		20	0	0		19	0	0		20	0	0		
41	32	0		31	0	0		26	0	0		32	0	0		25	0	0		32	0	0		
42	28	0		28	0	0		25	0	0		28	0	0		24	0	0		29	0	0		
43	20	0		19	0	0		19	0	0		19	0	0		18	0	0		19	0	0		
44	26	0		24	0	0		23	0	0		23	0	0		22	0	0		24	0	0		
45	24	0		24	0	0		23	0	0		24	0	0		23	0	0		24	0	0		
46	26	0		26	0	0		25	0	0		26	0	0		24	0	0		26	0	0		
47	20	0		18	0	0		19	0	0		18	0	0		18	0	0		18	0	0		
48	25	0		25	0	0		26	0	0		25	0	0		25	0	0		25	0	0		
49	28	0		26	0	0		26	0	0		26	0	0		26	0	0		26	0	0		
50	21	0		18	0	0		18	0	0		20	0	0		18	0	0		19	0	0		
51	26	0		23	0	0		23	0	0		23	0	0		23	0	0		23	0	0		
52	35	0		34	0	0		34	0	0		35	0	0		34	0	0		34	0	0		
53	22	0		18	0	0		19	0	0		18	0	0		18	0	0		18	0	0		

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
54	38	2	e	31	0	-2		34	0	-2		39	5	3	e	34	0	-2		35	0	-2		
55	26	0		21	0	0		22	0	0		22	0	0		21	0	0		22	0	0		
56	32	0		32	0	0		33	0	0		34	0	0		31	0	0		33	0	0		
57	24	0		18	0	0		19	0	0		19	0	0		18	0	0		19	0	0		
58	26	0		26	0	0		26	0	0		26	0	0		26	0	0		26	0	0		
59	16	0		13	0	0		13	0	0		13	0	0		12	0	0		13	0	0		
60	20	0		21	0	0		22	0	0		21	0	0		21	0	0		21	0	0		
61	29	0		20	0	0		22	0	0		22	0	0		21	0	0		21	0	0		
62	32	0		27	0	0		28	0	0		28	0	0		27	0	0		27	0	0		
63	32	0		28	0	0		29	0	0		29	0	0		29	0	0		30	0	0		
64	32	0		29	0	0		29	0	0		29	0	0		29	0	0		31	0	0		
65	31	0		30	0	0		32	0	0		31	0	0		30	0	0		31	0	0		
66	29	0		28	0	0		28	0	0		28	0	0		28	0	0		28	0	0		
67	28	0		28	0	0		29	0	0		29	0	0		28	0	0		29	0	0		
68	17	0		17	0			17	0	0		17	0	0		17	0	0		17	0	0		
69	15	0		16	0	0		17	0	0		17	0	0		17	0	0		17	0	0		
70	23	0		26	0	0		25	0	0		26	0	0		25	0	0		26	0	0		Waterfront Terrace
71	33	0		33	0	0		34	0	0		34	0	0		33	0	0		33	0	0		Waterfront Terrace
72	27	0		30	0	0		31	0	0		30	0	0		30	0	0		31	0	0		
73	32	0		35	0	0		36	0	0		36	0	0		35	0	0		35	0	0		
74	31	0		25	0	0		26	0	0		26	0	0		26	0	0		26	0	0		
75	30	0		28	0	0		28	0	0		29	0	0		28	0	0		29	0	0		Waterfront Terrace
76	30	0		23	0	0		23	0	0		24	0	0		23	0	0		24	0	0		Waterfront Terrace
77	31	0		27	0	0		27	0	0		27	0	0		27	0	0		27	0	0		Waterfront Terrace
78	28	0		20	0	0		20	0	0		21	0	0		18	0	0		20	0	0		Waterfront Terrace
79	30	0		17	0	0		17	0	0		17	0	0		17	0	0		17	0	0		Waterfront Terrace
80	28	0		15	0	0		14	0	0		14	0	0		14	0	0		15	0	0		

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
81	29	0		14	0	0		13	0	0		13	0	0		12	0	0		13	0	0		
82	28	0		22	0	0		22	0	0		21	0	0		20	0	0		22	0	0		
83	22	0		14	0	0		15	0	0		14	0	0		15	0	0		15	0	0		
84	28	0		25	0	0		27	0	0		26	0	0		25	0	0		27	0	0		
85	15	0		29	0	0		29	0	0		28	0	0		28	0	0		28	0	0		
86	23	0		36	0	0		35	0	0		35	0	0		34	0	0		36	0	0		
87	23	0		34	0	0		35	0	0		33	0	0		34	0	0		34	0	0		
88	24	0		31	0	0		32	0	0		32	0	0		31	0	0		32	0	0		
89	26	0		22	0	0		22	0	0		22	0	0		21	0	0		22	0	0		
90	27	0		22	0	0		24	0	0		23	0	0		23	0	0		24	0	0		
91	24	0		19	0	0		18	0	0		19	0	0		18	0	0		18	0	0		
92	31	0		26	0	0		26	0	0		26	0	0		25	0	0		26	0	0		Building 12 Market Plaza and Market Square
93	29	0		28	0	0		28	0	0		28	0	0		28	0	0		28	0	0		
94	29	0		26	0	0		28	0	0		28	0	0		27	0	0		26	0	0		
95	16	0		30	0	0		33	0	0		31	0	0		32	0	0		31	0	0		
96	23	0		29	0	0		31	0	0		30	0	0		30	0	0		30	0	0		
97	26	0		27	0	0		30	0	0		28	0	0		29	0	0		29	0	0		
98	28	0		23	0	0		24	0	0		23	0	0		23	0	0		23	0	0		
99	28	0		21	0	0		24	0	0		22	0	0		23	0	0		23	0	0		
100	25	0		20	0	0		22	0	0		21	0	0		21	0	0		21	0	0		
101	23	0		20	0	0		21	0	0		21	0	0		21	0	0		20	0	0		
102	24	0		24	0	0		22	0	0		24	0	0		22	0	0		24	0	0		
103	25	0		23	0	0		23	0	0		23	0	0		23	0	0		24	0	0		
104	25	0		28	0	0		27	0	0		28	0	0		27	0	0		29	0	0		
105	27	0		23	0	0		24	0	0		23	0	0		25	0	0		23	0	0		
106	18	0		18	0	0		18	0	0		18	0	0		18	0	0		18	0	0		

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
107	16	0		18	0	0		18	0	0		18	0	0		18	0	0		18	0	0		
108	23	0		16	0	0		16	0	0		15	0	0		16	0	0		16	0	0		
109	23	0		19	0	0		18	0	0		18	0	0		19	0	0		18	0	0		
110	21	0		29	0	0		27	0	0		29	0	0		27	0	0		30	0	0		20th Street Plaza
111	20	0		20	0	0		18	0	0		20	0	0		19	0	0		20	0	0		20th Street Plaza
112	25	0		24	0	0		23	0	0		24	0	0		23	0	0		24	0	0		20th Street Plaza
113	19	0		21	0	0		21	0	0		22	0	0		21	0	0		23	0	0		20th Street Plaza
114	18	0		21	0	0		21	0	0		21	0	0		22	0	0		22	0	0		20th Street Plaza
115	32	0		30	0	0		24	0	0		28	0	0		24	0	0		31	0	0		20th Street Plaza
116	25	0		18	0	0		18	0	0		18	0	0		18	0	0		18	0	0		
117	26	0		23	0	0		23	0	0		23	0	0		25	0	0		23	0	0		
118	23	0		21	0	0		20	0	0		20	0	0		21	0	0		21	0	0		
119	23	0		21	0	0		19	0	0		20	0	0		19	0	0		21	0	0		
120	21	0		21	0	0		19	0	0		21	0	0		20	0			22	0	0		
121	Data not available			27	0	N/A		25	0	N/A		27	0	N/A		26	0	N/A		27	0	N/A		
122				23	0			22	0			23	0			23	0			23	0			
123				26	0			25	0			27	0			27	0			28	0			
124	17	0		14	0	0		14	0	0		14	0	0		14	0	0		14	0	0		
125	17	0		15	0	0		15	0	0		15	0	0		15	0	0		15	0	0		
126	22	0		21	0	0		20	0	0		20	0	0		20	0	0		20	0	0		
127	30	0		24	0	0		25	0	0		23	0	0		24	0	0		23	0	0		
128	27	0		25	0	0		25	0	0		25	0	0		25	0	0		25	0	0		
129	25	0		21	0	0		21	0	0		21	0	0		21	0	0		21	0	0		
130	28	0		25	0	0		25	0	0		24	0	0		24	0	0		24	0	0		
131	24	0		21	0	0		19	0	0		22	0	0		20	0	0		22	0	0		
132	28	0		26	0	0		26	0	0		25	0	0		25	0	0		26	0	0		
133	27	0		19	0	0		18	0	0		19	0	0		19	0	0		19	0	0		

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
134	28	0		32	0	0		31	0	0		32	0	0		31	0	0		31	0	0		
135	27	0		27	0	0		26	0	0		27	0	0		26	0	0		26	0	0		
136	27	0		17	0	0		17	0	0		17	0	0		17	0	0		17	0	0		
137	21	0		24	0	0		22	0	0		23	0	0		23	0	0		23	0	0		Irish Hill Playground
138	21	0		20	0	0		19	0	0		20	0	0		20	0	0		21	0	0		Irish Hill Playground
139	20	0		19	0	0		18	0	0		19	0	0		19	0	0		20	0	0		Irish Hill Playground
140	12	0		11	0	0		11	0	0		11	0	0		11	0	0		11	0	0		Irish Hill Playground
141	Data not available			36	0	N/A		34	0	N/A		36	0	N/A		35	0	0		36	0	N/A		
142				36	0			34	0			36	0			35	0	0		36	0			
143				37	1		e	35	0			37	1		e	36	0	0		37	2		e	
144	25	0		18	0	0		16	0	0		18	0	0		17	0	0		18	0	0		Irish Hill Playground
145	25	0		19	0	0		18	0	0		19	0	0		18	0	0		20	0	0		Irish Hill Playground
146	25	0		20	0	0		19	0	0		19	0	0		20	0	0		20	0	0		Irish Hill Playground
147	23	0		20	0	0		21	0	0		21	0	0		20	0	0		21	0	0		Irish Hill Playground
148	19	0		19	0	0		19	0	0		19	0	0		19	0	0		20	0	0		
149	19	0		22	0	0		22	0	0		22	0	0		23	0	0		22	0	0		Irish Hill Playground
150	18	0		18	0	0		17	0	0		18	0	0		17	0	0		18	0	0		
151	20	0		26	0	0		27	0	0		28	0	0		29	0	0		27	0	0		
152	26	0		27	0	0		29	0	0		28	0	0		29	0	0		29	0	0		
153	28	0		28	0	0		29	0	0		28	0	0		29	0	0		30	0	0		
154	21	0		13	0	0		12	0	0		13	0	0		13	0	0		13	0	0		
155	23	0		22	0	0		21	0	0		16	0	0		17	0	0		16	0	0		
156	24	0		24	0	0		24	0	0		16	0	0		17	0	0		17	0	0		
157	25	0		19	0	0		18	0	0		18	0	0		19	0	0		21	0	0		
158	26	0		21	0	0		21	0	0		19	0	0		20	0	0		20	0	0		Irish Hill Playground
159	20	0		18	0	0		18	0	0		18	0	0		19	0	0		18	0	0		Irish Hill Playground
160	20	0		21	0	0		21	0	0		21	0	0		21	0	0		21	0	0		Irish Hill Playground

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
161	21	0		24	0	0		23	0	0		24	0	0		24	0	0		25	0	0		Irish Hill Playground
162	25	0		23	0	0		22	0	0		22	0	0		22	0	0		22	0	0		Irish Hill Playground
163	28	0		29	0	0		28	0	0		27	0	0		27	0	0		30	0	0		Irish Hill Playground
164	19	0		24	0	0		23	0	0		24	0	0		25	0	0		25	0	0		Irish Hill Playground
165	Data not available			26	0	N/A		25	0	N/A		25	0	N/A		25	0	0		25	0	N/A		
166				35	0			34	0			36	0			34	0	0		36	0			
167				29	0			29	0			30	0			31	0	0		30	0			
168	15	0		25	0	0		25	0	0		25	0	0		24	0	0		25	0	0		Irish Hill Playground
169	27	0		18	0	0		17	0	0		19	0	0		20	0	0		20	0	0		
170	23	0		15	0	0		14	0	0		16	0	0		17	0	0		16	0	0		
171	33	0		16	0	0		15	0	0		17	0	0		17	0	0		31	0	0		
172	25	0		19	0	0		19	0	0		18	0	0		19	0	0		18	0	0		
173	23	0		20	0	0		20	0	0		20	0	0		20	0	0		20	0	0		
174	7	0		19	0	0		19	0	0		28	0	0		28	0	0		28	0	0		
175	24	0		20	0	0		19	0	0		23	0	0		22	0	0		22	0	0		
176	29	0		26	0	0		25	0	0		24	0	0		25	0	0		26	0	0		
177	29	0		20	0	0		19	0	0		20	0	0		19	0	0		19	0	0		
178	31	0		27	0	0		26	0	0		27	0	0		27	0	0		27	0	0		
179	31	0		23	0	0		22	0	0		23	0	0		23	0	0		24	0	0		
180	36	0		23	0	0		22	0	0		21	0	0		21	0	0		22	0	0		Building 12 Market Plaza and Market Square
181	32	0		24	0	0		22	0	0		26	0	0		27	0	0		27	0	0		
182	Data not available			23	0	N/A		21	0	N/A		23	0	N/A		22	0	N/A		26	0	N/A		
183	30	0		15	0	0		15	0	0		Data not available				Data not available				22	0	0		
184	25	0		17	0	0		16	0	0		15	0	0		15	0	0		12	0	0		
185	34	0		24	0	0		23	0	0		27	0	0		28	0	0		24	0	0		
186	31	0		30	0	0		29	0	0		25	0	0		25	0	0		26	0	0		

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
187	26	0		16	0	0		15	0	0		14	0	0		15	0	0		14	0	0		
188	31	0		28	0	0		27	0	0		25	0	0		25	0	0		30	0	0		
189	22	0		24	0	0		23	0	0		23	0	0		23	0	0		23	0	0		
190	23	0		24	0	0		24	0	0		23	0	0		23	0	0		23	0	0		
191	19	0		24	0	0		24	0	0		24	0	0		24	0	0		24	0	0		
192	Data not available			19	0	N/A		18	0	N/A		18	0	N/A		18	0	N/A		20	0	N/A		
193	Data not available			19	0	N/A		18	0	N/A		21	0	N/A		21	0	N/A		22	0	N/A		
194	10	0		18	0	0		17	0	0		18	0	0		18	0	0		19	0	0		Building 12 Market Plaza and Market Square
195	21	0		23	0	0		22	0	0		22	0	0		22	0	0		22	0	0		
196	19	0		16	0	0		16	0	0		17	0	0		16	0	0		18	0	0		
197	12	0		15	0	0		14	0	0		15	0	0		14	0	0		15	0	0		Building 12 Market Plaza and Market Square
198	14	0		17	0	0		16	0	0		16	0	0		16	0	0		17	0	0		Building 12 Market Plaza and Market Square
199	40	7	e	17	0	-7		17	0	-7		17	0	-7		16	0	-7		16	0	-7		Building 12 Market Plaza and Market Square
200	30	0		15	0	0		15	0	0		15	0	0		15	0	0		14	0	0		Building 12 Market Plaza and Market Square
201	33	0		24	0	0		25	0	0		24	0	0		25	0	0		25	0	0		Building 12 Market Plaza and Market Square
202	32	0		24	0	0		24	0	0		24	0	0		25	0	0		24	0	0		Building 12 Market Plaza and Market Square
203	25	0		23	0	0		24	0	0		23	0	0		23	0	0		24	0	0		Building 12 Market Plaza and Market Square

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
204	32	0		19	0	0		19	0	0		19	0	0		19	0	0		19	0	0		Building 12 Market Plaza and Market Square
205	Data not available			16	0	N/A		16	0	N/A		16	0	N/A		16	0	N/A		15	0	N/A		
206				20	0			19	0			19	0			17	0			19	0			
207				22	0			21	0			21	0			20	0			21	0			
208	26	0		20	0	0		20	0	0		19	0	0		18	0	0		20	0	0		Slipways Commons
209	26	0		20	0	0		20	0	0		20	0	0		19	0	0		20	0	0		Slipways Commons
210	16	0		21	0	0		20	0	0		20	0	0		20	0	0		20	0	0		Slipways Commons
211	27	0		20	0	0		20	0	0		20	0	0		19	0	0		19	0	0		Slipways Commons
212	32	0		16	0	0		16	0	0		16	0	0		16	0	0		16	0	0		Slipways Commons
213	28	0		15	0	0		16	0	0		16	0	0		16	0	0		15	0	0		Slipways Commons
214	32	0		22	0	0		21	0	0		22	0	0		21	0	0		22	0	0		Slipways Commons
215	30	0		25	0	0		24	0	0		25	0	0		25	0	0		24	0	0		Slipways Commons
216	29	0		21	0	0		21	0	0		20	0	0		20	0	0		21	0	0		Slipways Commons
217	Data not available			17	0	N/A		18	0	N/A		18	0	N/A		18	0	N/A		18	0	N/A		
218				14	0			14	0			14	0			14	0			14	0			
219				9	0			8	0			9	0			9	0			9	0			
220	29	0		21	0	0		21	0	0		21	0	0		21	0	0		21	0	0		Slipways Commons
221	31	0		29	0	0		29	0	0		28	0	0		28	0	0		29	0	0		Slipways Commons
222	28	0		21	0	0		21	0	0		21	0	0		21	0	0		21	0	0		Slipways Commons
223	30	0		10	0	0		11	0	0		11	0	0		11	0	0		11	0	0		Waterfront Terrace
224	32	0		20	0	0		19	0	0		20	0	0		20	0	0		20	0	0		Waterfront Terrace
225	31	0		26	0	0		27	0	0		25	0	0		26	0	0		27	0	0		Slipways Commons
226	32	0		26	0	0		27	0	0		26	0	0		26	0	0		27	0	0		Slipways Commons
227	33	0		31	0	0		31	0	0		31	0	0		30	0	0		31	0	0		Waterfront Promenade
228	32	0		25	0	0		25	0	0		23	0	0		24	0	0		25	0	0		Slipways Commons
229	29	0		25	0	0		24	0	0		25	0	0		25	0	0		24	0	0		Slipways Commons

Table 4.I.2 Continued

References	Existing			Existing + Residential				Residential + Cumulative				Existing + Commercial				Commercial + Cumulative				Existing + Commercial –Pedestrian Passageway Option				Public Spaces
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours per Year Wind Speeds Exceed Hazard Criteria	Hours Change Relative to Existing	Exceeds	Pier 70 Project Open Space Network Areas
230	32	0		22	0	0		21	0	0		21	0	0		20	0	0		21	0	0		Slipways Commons
231	29	0		26	0	0		26	0	0		26	0	0		26	0	0		25	0	0		
232	28	0		24	0	0		23	0	0		21	0	0		21	0	0		22	0	0		
233	25	0		20	0	0		20	0	0		19	0	0		20	0	0		21	0	0		
234	29	0		24	0	0		24	0	0		22	0	0		21	0	0		22	0	0		
235	32	0		19	0	0		18	0	0		24	0	0		24	0	0		23	0	0		
236	26	0		26	0	0		24	0	0		21	0	0		20	0	0		19	0	0		
237	30	0		23	0	0		22	0	0		22	0	0		22	0	0		22	0	0		
238	32	0		24	0	0		24	0	0		23	0	0		24	0	0		23	0	0		
239	32	0		21	0	0		21	0	0		18	0	0		18	0	0		18	0	0		Waterfront Promenade
240	30	0		15	0	0		14	0	0		14	0	0		14	0	0		14	0	0		Waterfront Promenade
241	30	0		24	0	0		23	0	0		25	0	0		25	0	0		26	0	0		
242	32	0		25	0	0		25	0	0		23	0	0		22	0	0		23	0	0		
243	34	0		29	0	0		29	0	0		24	0	0		24	0	0		24	0	0		Waterfront Promenade
244	33	0		27	0	0		27	0	0		26	0	0		25	0	0		26	0	0		Waterfront Promenade
245	27	0		19	0	0		18	0	0		25	0	0		24	0	0		25	0	0		Waterfront Promenade
246	35	0		21	0	0		21	0	0		22	0	0		22	0	0		21	0	0		Waterfront Promenade
247	28	0		17	0	0		18	0	0		16	0	0		15	0	0		16	0	0		Waterfront Promenade
248	34	0		25	0	0		25	0	0		24	0	0		23	0	0		24	0	0		Waterfront Promenade
Average speed, Total hours; Total exceedances	**25 mph**	**9 hrs**	**2 of 248**	**23 mph**	**1 hr**	**-8 hrs**	**1 of 248**	**22 mph**	**0 hrs**	**-9 hrs**	**0 of 248**	**22 mph**	**6 hrs**	**-3 hrs**	**2 of 247**	**22 mph**	**0 hrs**	**-9 hrs**	**0 of 247**	**23 mph**	**2 hrs**	**-7 hrs**	**1 of 247**	

Overview by Test Scenario

Baseline Conditions - Pedestrian-Level Wind Speeds

COMFORT CRITERION

Wind speeds were measured at 230 ground-level test locations for baseline conditions. Figure 4.I.2, p. 4.I.15, shows the pedestrian wind comfort conditions for this configuration.[18] The wind tunnel test results are shown in Tables 4.I.1 and 4.I.2, pp. 4.I.17-4.I.26 and pp. 4.I.27-4.I.36, respectively.

Under baseline conditions, the average equivalent wind speed for the wind comfort analysis at the 230 test locations is approximately 13 mph. The range of measured wind speeds is from 4 to 20 mph.[19] Under baseline conditions, 68 of the 230 test locations meet the comfort criteria, and 162 do not. In other words, a majority of test points exceed the 11-mph comfort criterion under baseline conditions as shown in Figure 4.I.2.

The highest baseline wind speeds include locations adjacent to the western sides or corners of buildings, such as adjacent to Building 103 beyond the northern edge of the project site (20 mph at test point 54), corner of Building 105 on 20th Street (19 mph at test point 52), and the southwestern corner of Building 66 (18 mph at test point 199). The shoreline and slipway areas also experience 18-mph winds, e.g., shoreline at southeastern corner of project site (test point 238), near the shoreline (test point 243), and along the shoreline at the slipways (test points 226, 239, 246, and 248).

There are wind conditions between 8 and 11 mph, shown in yellow on Figure 4.I.2, to the east of certain buildings, such as east of Buildings 114, 115, 14, 12, 15, and 16 (e.g., test points 210, 195, and 196). These locations are on the leeward side of buildings (the side sheltered from the wind). The calmest winds, shown in blue (less than 7 mph) are on the eastern edges of Buildings 12 and 15 (test points 194, 195, 197) and the southwestern corner of Building 117 (test point 140).

[18] As discussed under "Approach to Analysis" above, the Pier 70 Design for Development provides concepts and approximate hypothetical site plans that are subject to change. Therefore, whether a particular open space location would have public seating (7-mph comfort criterion) or not (11-mph pedestrian comfort criterion) is subject to change. The Pedestrian Wind Study's assignment of 7 mph and 11 mph as the comfort criterion for a particular test points is based on the draft Pier 70 Design for Development's seating arrangement. Those assignments are shown in Tables 4.I.1 and 4.I.2. As mentioned above, because the public seating locations are subject to change, this EIR focuses on the 11-mph wind speed.

[19] Unless otherwise specified, wind speeds discussed are the 90th percentile wind speeds, i.e., the wind speed exceeded only 10 percent of the time. Thus, the highest wind speeds cited above are not the peak instantaneous wind speed that may be experienced at pedestrian level.

HAZARD CRITERION

The wind hazard criterion of Planning Code Section 148 is exceeded at two locations under Baseline conditions: adjacent to, and west of, Building 103 beyond the northern edge of the project site (test point 54), and near the southwest corner of Building 66, between Buildings 66 and 12 (test point 199). The Building 103 location exceeds the hazard criterion for 2 hours per year with wind speeds of 38 mph. Building 103 is outside the project site.[20] The Building 66 location exceeds the hazard criterion for 7 hours per year with wind speeds of 40 mph. This is due at least in part to air being accelerated by going through the "pinch point" between the two buildings (i.e., "wind funneling" whereby the opening through which wind flows is narrowed, thereby increasing wind speeds through the opening).

Maximum Residential Scenario Wind Speeds

COMFORT CRITERION

Under the Proposed Project's Maximum Residential Scenario at full build-out, the average of wind speeds at the 248 test points is 12 mph. The range of wind speeds is from 6 to 20 mph. Figure 4.I.3: Pedestrian Wind Comfort and Hazard Conditions - Maximum Residential Scenario shows the pedestrian wind comfort conditions for the Maximum Residential Scenario. Under the Maximum Residential Scenario, 129 of the 248 test locations comply with the 11-mph comfort criterion, and 119 do not.[21]

As shown in Figure 4.I.3, many of the areas where wind speeds exceed the 11-mph criterion under baseline conditions would be reduced to 8 to11 mph under the Maximum Residential Scenario. Proposed buildings would serve to block wind in the following situations:

- The northeastern portion of the 28-Acre Site, which is in an open area under baseline conditions, but between Parcels B, E1, and E4 under the Maximum Residential Scenario (test points 79, 80, 81, and 82);
- An area between Parcels B, E1, and E4 (test points 79 through 82);
- Within the proposed Irish Hill Playground area (test points 161 and 162); and
- An area in the south-central part of the 28-Acre Site, which would be adjacent to development on Parcel F (test points 175 and 181).

[20] For test point 54 at Building 103, the Pedestrian Wind Study (p. 7) states, "The off-site location to the north is inherently gusty, and the hazard is not caused by the proposed development. Gust speeds in such gusty areas can vary between similar wind tunnel tests. The average wind speed exceeded 1 hour/year is 22 mph."

[21] When comparing the comfort criteria exceedances, it is important to remember that there are 18 additional test points for the Maximum Residential Configuration as compared to the Baseline Conditions Configuration. This makes the net decrease of 21 points more meaningful.



Source: RWDI, Pier 70 Mixed Use District Project EIR; Final Report: Pedestrian Wind Study, Wind Tunnel Tests, Figures 2b and 3b, November 30, 2015.

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FIGURE 4.I.3: PEDESTRIAN WIND COMFORT AND HAZARD CONDITIONS – MAXIMUM RESIDENTIAL SCENARIO

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However, wind speeds would increase under the Maximum Residential Scenario, as compared to baseline conditions, at locations such as adjacent to Building 12 (test points 194, 197, and 198, increasing 2 to 5 mph), likely due to the introduction of taller buildings across the street to the east.

Under the Maximum Residential Scenario, Parcels C1 and C2 could be developed with residential uses or with structured parking that includes rooftop open space. If residential uses are built on Parcels C1 and C2, there would be no rooftop open space, and the wind speeds measured at test points 141 through 143 and 166 would not be relevant to the analysis of the project's wind impacts. If structured parking with rooftop open space is built on Parcels C1 and C2, then wind speeds on those rooftops would be of concern. Some of the highest wind speeds under the Maximum Residential Scenario would be on the rooftops of Parcels C1 and C2, e.g., 19 to 20 mph at test points 141 through 143 (rooftop of Building C1), and 19 mph at test point 166 (rooftop of Building C2).

HAZARD CRITERION

If structured parking is not built on Parcels C1 and C2, the wind hazard criterion of Planning Code Section 148 would not be exceeded at any of the 248 test locations under the Maximum Residential Configuration.

However, if district structured parking is built on Parcel C1 with rooftop public open space, then there would be a hazard criterion exceedance at test point 143.

Maximum Commercial Scenario Wind Speeds

COMFORT CRITERION

Under the Proposed Project's Maximum Commercial Configuration at full build-out, the average of the existing wind speeds at the 247 test points[22] is 12 mph. The range of measured wind speeds is from 6 to 21 mph. Figure 4.I.4: Pedestrian Wind Comfort and Hazard Conditions - Maximum Commercial Scenario, p. 4.I.43, shows the pedestrian wind conditions for this configuration. Under the Maximum Commercial Scenario, 133 of the 247 test locations meet the comfort criterion, and 115 do not.

Similar to the Maximum Residential Scenario, the Maximum Commercial Scenario alters the overall pattern of wind speeds, compared to baseline conditions. The highest wind speeds occur at the western faces or southwestern corners of buildings, including: adjacent to Building 103 at

[22] Under the Maximum Commercial Configuration, test point 183 between Parcels F and G does not exist. Test point 183 is used in the Maximum Commercial - Pedestrian Passageway Option Configuration.

the northern edge of the project site (21 mph at test point 54); southwestern corner of Building 6 (19 mph at test point 71); southwestern corner of Building 105, north of the project site (18 mph at test point 52 and 18 mph at test point 56).

Also similar to the Maximum Residential Scenario, if structured parking with rooftop open space is built on Parcels C1 and C2 under the Maximum Commercial Scenario, then wind speeds on those rooftops would be of concern. Some of the highest wind speeds under the Maximum Commercial Scenario would be on the rooftops of Parcels C1 and C2, e.g., 19 to 20 mph at test points 141 through 143 (rooftop of Building C1), and 19 mph at 166 (rooftop of Building C2).

HAZARD CRITERION

The wind hazard criterion of Planning Code Section 148 would be exceeded at one of the 247 test locations under the Maximum Commercial Configuration. Adjacent to Building 103, test point 54 would exceed the hazard criterion (39 mph) for 5 hours per year, which is 3 more hours than under baseline conditions. This point is adjacent to, and west of, Building 103 beyond the northern edge of the project site.

Additionally, if structured parking is built on Parcel C1 with rooftop public open space, then there would be a hazard criterion exceedance at test point 143.

Maximum Commercial - Pedestrian Passageway Option - Wind Speeds

COMFORT CRITERION

The Maximum Commercial Scenario - Pedestrian Passageway Option provides for north-south pedestrian passageways for three pairs of parcels on the southern part of the project site. Compared to the Maximum Commercial Scenario, this option also has less building mass between Parcels H1 and H2 along the north-south pedestrian passageway. Figure 4.I.5: Pedestrian Wind Comfort and Hazard Conditions - Maximum Commercial Scenario - Pedestrian Passageway Option, p. 4.I.45, shows the pedestrian wind comfort conditions for this configuration.

Wind tunnel testing of this option shows the following results: between Parcels H1 and H2 (at test point 235 at ground level), the wind speed drops from 12 mph under the Maximum Commercial Scenario to 11 mph with the Passageway Option. (Both results are less than the 17 mph at test point 235 under baseline conditions.) Under the Passageway Option, the passageway between Parcels F and G (test point 183) has a wind speed of 10 mph.[23] This does not exceed the pedestrian comfort criterion of 11 mph.

[23] There is no test point 183 under the Maximum Commercial Scenario configuration, because the location is within the building mass.



Source: RWDI, Pedestrian Wind Study.

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FIGURE 4.1.4: PEDESTRIAN WIND COMFORT AND HAZARD CONDITIONS – MAXIMUM COMMERCIAL SCENARIO

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Source: RWDI, Pedestrian Wind Study.

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FIGURE 4.I.5: PEDESTRIAN WIND COMFORT AND HAZARD CONDITIONS – MAXIMUM COMMERCIAL SCENARIO – PEDESTRIAN PASSAGEWAY OPTION

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Between Parcels HDY1 and HDY2, the Passageway Option (test points 156, 157, and 158), extending from 22nd Street to the Irish Hill Playground, has 8- to 11-mph winds under the option, versus 8- to 10-mph winds under the Maximum Commercial Scenario. Under the Passageway Option, none of the test points exceed the comfort criterion.

HAZARD CRITERION

Under the Pedestrian Passageway Option, at the area adjacent to Building 103 (test point 54), beyond the northern edge of the 28-Acre Site, the wind hazard exceedance under the Maximum Commercial Scenario (39 mph) is reduced to 35 mph, i.e., below the wind hazard criterion. The basis for this change is unclear, as Building 103 is distant from the pedestrian passageways, but "[g]ust speeds in such gusty areas can vary between similar wind tunnel tests."[24]

Additionally, if structured parking is built on Parcel C1 with rooftop public open space, then there would be a hazard criterion exceedance (37 mph) at test point 143.

Public Open Spaces within the Project Site

The wind conditions that would exist at each proposed public open space within the project site are summarized below. Although the comfort criteria are not used as thresholds of significance in this EIR under CEQA, wind speeds over 11 mph and their locations are noted, as these will provide the reader with information about the usability and suitability of the proposed open spaces for various uses from a wind perspective.

Improvement measures for the public open spaces are described below under "Project Impacts." The conceptual locations for public seating, which are subject to change, are discussed and improvement measures suggested. As discussed above under "Significance Thresholds" on pp. 4.I.6-4.I.7, the City uses the Planning Code's hazard criterion for determining whether a project would result in a significant impact. The comfort criteria-related effects are not significant environmental impacts and are discussed in this section for informational purposes.

Waterfront Terrace

The Waterfront Terrace extends from the northeastern corner of the project site along the waterfront to nearly the southern end of Parcel E4, where it meets Slipways Commons (at the northernmost slipway), as shown in Figure 2.15: Proposed Open Space Plan, in Chapter 2, Project Description, p. 2.46. The concept design includes three primary spaces running north to south: the Building 6 viewing pavilion, the social lawn, and eating and drinking space.

[24] Pedestrian Wind Study, p. 7.

COMFORT CRITERION

Test points in the interior of the proposed Waterfront Terrace include 75, 76, 77, and 78. Under baseline conditions, winds at these test points range from 15 to 18 mph, which exceeds the 11-mph criterion. Under the Maximum Residential Scenario, winds at these test points range from 9 to 14 mph, with one point (test point 78) below 11 mph and the other three points (test points 75, 76, and 77) exceeding 11 mph. Wind speed results for the Maximum Commercial Scenario are nearly identical, except that test point 76 is windier (13 mph rather than 12 mph). (See Table 4.I.1, pp. 4.I.17-26.)

Based on the reduction of wind speeds, the proposed buildings may serve as partial obstacles to the winds from westerly directions, particularly shielding the southern part of the Waterfront Terrace (test point 78). However, the Waterfront Terrace would still be subject to winds from the northwesterly and easterly directions. Northwest winds are likely to accelerate around the northeastern corner of Parcel B.[25] Westerly winds would likely channel between Buildings E3 and E4.

Around the edges of the proposed Waterfront Terrace and/or next to buildings adjacent to the open space are test points 70, 71, 74, 79, 80, 223, and 224. Wind speeds decrease from the Existing Scenario under the Maximum Residential Scenario at test points 74, 79, 80, 223, and 224. For the northern part of the open space, the pedestrian comfort results for test points 70 and 71 are not much different than those under the baseline conditions, Maximum Residential Scenario, and Maximum Commercial Scenario. It is likely that the blocking of westerly winds by the Proposed Project is not as effective at their exposed location and/or the blocking effect is offset by the distance of these test points to buildings.

HAZARD CRITERION

No wind hazard criterion exceedances would occur at any of the test points in the Waterfront Terrace area under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario.

Waterfront Promenade

The proposed Waterfront Promenade extends from the southeastern corner of the project site along the waterfront to just north of Parcel E3, where it meets Slipways Commons. It would include pedestrian and bike paths and possibly outdoor eating areas.

[25] Pedestrian Wind Study, p. 9.

COMFORT CRITERION

Under baseline conditions, winds within the proposed Waterfront Promenade (at test points 238, 239, 245, 246, and 248) range from 15 to 18 mph, exceeding the 11-mph criterion. Under the Maximum Residential Scenario, winds at these five test points range from 9 to 13 mph, with winds at two test points below the 11-mph criterion and winds at three test points (238, 246, and 248) above 11 mph. Similar to the Waterfront Terrace, the proposed buildings serve as obstacles to the winds from westerly directions.

Results shown in Table 4.I.1 for the Maximum Commercial Scenario are similar, except that test point 245 is windier (12 mph rather than 9 mph). The winds also range from 9 to 13 mph, constituting a mix of areas exceeding and not exceeding the 11-mph criterion.

HAZARD CRITERION

No wind hazard criterion exceedances would occur at any of the test points in the Waterfront Promenade area under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario.

Slipways Commons

The proposed Slipways Commons would extend from the proposed Maryland Street to the shoreline. It is envisioned as a place for passive recreation, daytime community gatherings, and cultural events and nighttime activities such as art, light shows, evening festivals, and performances.[26]

COMFORT CRITERION

Under baseline conditions, winds within and around the edges of the proposed Slipways Commons (test points 208, 209, 211 through 216, 220 through 222, and 225 through 230) range from 12 to 18 mph. Under the Maximum Residential Scenario, winds at these test points range from 8 to 15 mph, with seven points below the 11-mph criterion and ten points at or above 11 mph (test points 215, 220, 221, 222, 225, 226, 227, 228, 229, and 230). Wind speed results for the Maximum Commercial Scenario are very similar to those for the Maximum Residential Scenario, except that the Maximum Commercial Scenario would result in an additional exceedance at test point 214 (11 mph rather than 10 mph).

[26] *Pier 70 SUD Design for Development*, p. xii.

HAZARD CRITERION

No wind hazard criterion exceedances would occur at any of the test points in the proposed Slipways Commons area under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario.

Building 12 Market Plaza and Market Square

Building 12 Market Plaza and Market Square would be open spaces north, east, and south of Building 12 that may be used for temporary events, such as market stalls, as well as for artworks and community gatherings.[27]

COMFORT CRITERION

Test points in the Building 12 Market Plaza and Market Square open areas include 193, 194, 197 through 199, and 202 through 205. Under baseline conditions, winds at these locations range from 5 to 18 mph. Under the Maximum Residential Scenario, winds at these test points range from 9 to 14 mph, with seven test points below the 11-mph criterion and two test points (202 and 203) above 11 mph. Wind speed results for the Maximum Commercial Scenario are identical to those for the Maximum Residential Scenario. The public courtyard in the area between Buildings 2 and 12 would experience high wind speeds due to west and west-southwest flow over the shorter Building 2 and downwash from the courtyard-facing façades of Building D-1.

HAZARD CRITERION

No wind hazard criterion exceedances would occur at the Building 12 Market Plaza and Market Square under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario. Because Building 66 would be demolished, there would no longer be a narrow space between Buildings 66 and 12, which resulted in the baseline conditions hazard exceedance at test point 199.

Irish Hill Playground

The Irish Hill Playground would be adjacent to, and south of, the remnant of Irish Hill. Conceptual ideas for its use include a children's play area, community gardens, and public seating for all ages.[28]

[27] *Pier 70 SUD Design for Development*, p. 45.
[28] *Pier 70 SUD Design for Development*, p. 61.

COMFORT CRITERION

Under baseline conditions, the area designated for the proposed Irish Hill Playground has winds between 11 to 15 mph. (Test points in this open area include 159 through 163, along with east side of Parcel PKS, and test points 144 through 146.) Under the Maximum Residential Scenario, winds at these test points range from 9 to 13 mph, with seven points below the 11-mph criterion and one point (test point 163) at or above 11 mph. Wind speed results for the Maximum Commercial Scenario are very similar to the Maximum Residential Scenario, except that the Maximum Commercial Scenario results in an additional comfort exceedance at test point 145 (11 mph rather than 10 mph). In sum, the Proposed Project would reduce winds at a majority of test points at the Irish Hill Playground below the 11-mph comfort criterion.

HAZARD CRITERION

No wind hazard criterion exceedances would occur at any of the test points in the Irish Hill Playground under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario.

20th Street Plaza

The 20th Street Plaza, at the northwestern corner of the project site, would be a gateway plaza. Potential open space features include a seating terrace and stormwater garden terraces.[29]

COMFORT CRITERION

Under baseline conditions, winds at the proposed 20th Street Plaza (test points 110 through 115, at the corner of 20th and Illinois streets) range from 9 to 16 mph, with three points below the 11-mph criterion and three points (test points 111,112, and 115) at or above 11 mph. Under the Maximum Residential Scenario, winds at these test points range from 9 to 14 mph, with two points below the 11-mph criterion and four points (test points 110, 112, 114, and 115) at or above 11 mph. Wind speed results for the Maximum Commercial Scenario are very similar to those for the Maximum Residential Scenario, but with three points below the 11-mph criterion and three points at or above 11 mph. Generally, the Proposed Project has only a small effect in reducing winds in the 20th Street Plaza. The Proposed Project would not provide much shielding from the predominant winds.

HAZARD CRITERION

No wind hazard criterion exceedances would occur at the 20th Street Plaza under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario.

[29] *Pier 70 Design for Development*, p. 71.

Rooftop Open Space

If Parcels C1 and C2 are built as structured parking, there would be public open space on the rooftops. Conceptual uses include sports courts, play terraces, viewing, and food cultivation. There are no existing conditions wind results applicable to rooftops.

COMFORT CRITERION

Under the Maximum Residential Scenario, winds from Parcel C1 rooftop[30] (test points 141, 142, and 143) range from 19 to 20 mph, exceeding the 11-mph criterion. Wind speed results for the Maximum Commercial Scenario are identical to those for the Maximum Residential Scenario.

Under the Maximum Residential Scenario, winds from the Parcel C2 rooftop[31] (test points 165, 166, and 167) range from 14 to 19 mph, with each of these test points exceeding the 11-mph criterion. If built as a parking structure, the roof heights may be less than 90 feet, thereby reducing the wind speeds. Wind speed results for the Maximum Commercial Scenario are very similar to those for the Maximum Residential Scenario, except that the Maximum Commercial Scenario would be windier at test point 161 (17 mph compared to 16 mph).

HAZARD CRITERION

Under the Maximum Residential Scenario and Maximum Commercial Scenario, the wind hazard criterion of Planning Code Section 148 would be exceeded on the rooftop of Building C1 at test point 143 (37 mph) for 1 hour per year. Under the Maximum Commercial Scenario - Pedestrian Passageway Option, the wind hazard criterion would be exceeded on the rooftop of Building C1 at test point 143 (37 mph) for 2 hours per year.[32]

Public Open Spaces Outside the Project Site

Future Historic Core Plaza

The planned Historic Core Plaza is part of the baseline. It is an approximately 45,000-square-foot plaza south of Building 113 and east of Buildings 114, 115, and 116. It would be constructed as part of the adjacent 20th Street Historic Core Project.

[30] Building C1 modeled at a maximum height of 90 feet.
[31] Building C2 was modeled at a maximum height of 90 feet.
[32] These wind tunnel test results assume a height of 90 feet for the roof. If built as a parking structure, the roof heights may be less, reducing the wind speed. However, the wind speeds may still exceed the hazard criterion.

COMFORT CRITERION

Under baseline conditions, winds at the Historic Core Plaza (test points 125 through 130) range from 9 to 15 mph, with one point (test point 125) below the 11-mph criterion and five points above 11 mph. Under the Maximum Residential Scenario, winds at these same test points decrease about 1 to 2 mph, ranging from 8 to 14 mph, with one point (test point 125) below the 11-mph criterion and five points at or above 11 mph. Wind speed results for the Maximum Commercial Scenario are very similar to those for the Maximum Residential Scenario, except that the Maximum Commercial Scenario would be less windy at test points 126 (11 mph compared to 12 mph), 129 (11 mph compared to 12 mph), and 130 (13 mph compared to 14 mph).

HAZARD CRITERION

No wind hazard criterion exceedances in the future Historic Core Plaza would occur under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario.

Future Crane Cove Park

Crane Cove Park is under development as a maritime and viewing area, and would include features such as an amphitheater, picnic sites, a promenade, overlooks, playgrounds, a senior fitness park, and walking areas.

COMFORT CRITERION

Under baseline conditions, winds at Crane Cove Park (test point 38) are 18 mph, exceeding the 11-mph pedestrian comfort criterion. Under the Maximum Residential Scenario, the wind speed is 19 mph. Under the Maximum Commercial Scenario, the wind speed is 15 mph.

HAZARD CRITERION

No wind hazards would occur in the proposed Crane Cove Park under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario.

Sidewalks within the Project Site

The Proposed Project includes construction of sidewalks within the project site.

COMFORT CRITERION

Sidewalks along a number of streets within the project site would experience winds exceeding the 11-mph comfort criterion under the Maximum Residential and Maximum Commercial scenarios. Pedestrians and bicyclists at these locations would be affected. As shown in Figures 4.I.3 and

4.I.4, p. 4.I.39 and p. 4.I.43, respectively, the sidewalks with wind speeds exceeding the 11-mph comfort criterion include the following:

- 20th Street, particularly next to Parcels A and B;
- 21st Street, particularly adjacent to Parcel C1;
- 22nd Street, between Parcels H1 and E2, and between Parcels H2 and E3;
- Michigan Street;
- Louisiana Street; and
- Maryland Street, between Parcels A and B.

HAZARD CRITERION

No wind hazard criterion exceedances would occur under baseline conditions, the Maximum Residential Scenario, and the Maximum Commercial Scenario on sidewalks within the project site.

IMPACT EVALUATION

Discussion of the effects of the Proposed Project under the City's pedestrian comfort criterion is provided here for informational purposes only, as the threshold used to identify significant impacts is the hazard criterion.

Impact WS-1: The phased development of the Proposed Project would temporarily alter wind in a manner that substantially affects public areas. ***(Less than Significant with Mitigation)***

Construction of the Proposed Project is expected to occur in phases and take approximately 11 years to reach full build-out. Although the Proposed Project at full build-out would generally slightly improve wind conditions on the project site, potentially significant interim wind impacts may occur prior to the completion of construction. Due to phased build-out, a particular building configuration resulting from partial completion of the Proposed Project could last for one or more years, creating the potential for interim wind impacts. Furthermore, if the Proposed Project were not completed, a partial build-out situation would occur, resulting in different wind characteristics than those tested in the wind tunnel.

The wind tunnel testing performed for this EIR provides information about the wind conditions on sidewalks, streets, parks, and open spaces within and in the vicinity of the Proposed Project only at full build-out for the massings in the configurations tested. Wind testing for the EIR assumes full build-out, with massing models for future proposed buildings in the project site providing shelter from prevailing winds for buildings downwind. Prior to full build-out, stronger pedestrian-level winds than those presented for the Pier 70 Pedestrian Wind Study are likely to

occur on open spaces and at individual building sites. Thus, wind hazard criterion exceedances could occur at locations not identified in the wind tunnel test scenarios. The potential for exceedances of the wind hazard criterion during the phased construction period would occur under the Maximum Residential Scenario and the Maximum Commercial Scenario. Additionally, the ultimate build-out of the Proposed Project might not maximize the development potential under either of these two scenarios.

The Pedestrian Wind Study does not provide numerical results about wind conditions during interim stages of development and, as a practical matter, cannot provide such information, due to the number of possible permutations of development. For commercial parcels, maximum envelope massings were used in the Pedestrian Wind Study for this EIR. For residential parcels, representative residential building typologies were used in the Pedestrian Wind Study for this EIR, not architectural designs, which might give different results. Once surrounding buildings have been completed and provide effective wind shelter, it is possible that these temporary impacts would cease; however, they may not, depending on the architectural designs of those buildings. Depending upon the circumstances of the construction, these temporary impacts could continue until the full build-out. Because such impacts are anticipated to occur, they are considered to be potentially significant impacts.

Because potential wind hazards could result from a very large number of possible combinations of different building designs, and permutations of construction sequences during the build-out of the Proposed Project, predicting the occurrence of all such hazards is not possible.

Based on the Pedestrian Wind Study and knowledge of the prevailing wind directions, development of buildings on the project site generally from the west to the east would provide the best protection from potential wind hazards. The amount of sheltering provided by then-existing buildings on adjacent parcels or areas located upwind (to the southwest, west, northwest, and north) of a subsequent development site should be considered.

The existing buildings across Illinois Street, to the west of the project site, provide sufficient shelter from prevailing winds for buildings proposed on Parcels PKN and PKS. However, there is insufficient provision of shelter from across the BAE shipyard for Parcels A and B, and from across the PG&E Potrero Substation for Parcel F.

The existing historic buildings to the west and north of Parcel A would not sufficiently protect Parcel A, because the heights of the historic buildings are significantly lower than the proposed maximum 90-foot height for Parcel A. Where there is a taller building downwind of lower buildings, there is a potential for wind hot spots, in this case, a classic wind trap effect where winds are funneled into an area.

Depending on circumstances, such as the heights and proximity of surrounding buildings, buildings under 80 feet in height, would be less likely to create wind hazards.

As described above, in addition to the impacts identified in this EIR for the Proposed Project, at full build-out there may be potential temporary wind hazard impacts associated with certain new structures within the project site where insufficient protection from strong winds exists at the time of construction and occupancy. This applies to all proposed buildings over 80 feet in height.

During the period before full build-out of the Proposed Project, wind hazards could occur at public locations that were not identified in the Pedestrian Wind Study and/or identified wind hazards could be increased in severity or extent. Such wind hazards would likely exist until buildings on adjacent parcels are completed and provide shelter from the unabated force of the wind. This would be a significant impact. Since the duration of construction is expected to be 11 years, mitigation measures, such as architectural canopies or screens, fences, shrubs, trees (limited by the need to preserve the integrity of the Historic District), and/or street furniture to offer wind protection and/or to limit access to the hazardous area(s), would be necessary to prevent exposure of pedestrians, cyclists, residents, or occupants to hazardous winds in pedestrian areas during that temporary interval.

Implementation of Mitigation Measure M-WS-1: Identification and Mitigation of Interim Hazardous Wind Impacts, shown below, would reduce the project's significant wind impact to a less-than-significant level.

> **Mitigation Measure M-WS-1: Identification and Mitigation of Interim Hazardous Wind Impacts**
>
> When the circumstances or conditions listed in Table M.WS.1 are present at the time a building Schematic Design is submitted, the requirements described below apply:

Table M.WS.1: Circumstances or Conditions during which Mitigation Measure M-WS-1 Applies

Subject Parcel Proposed for Construction	Circumstance or Condition	Related Upwind Parcels
Parcel A	Construction of any new buildings on Parcel A.	NA
Parcel B	Construction of any new buildings on Parcel B.	NA
Parcel E2	Construction of any new buildings on Parcel E2 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels H1 and G that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels H1 and G
Parcel E3	Construction of any new buildings on Parcel E3 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels E2 and G that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels E2 and G
Parcel F	Construction of any new buildings on Parcel F.	NA
Parcel G	Construction of any new buildings on Parcel G.	NA
Parcel H1	Construction of any new buildings on Parcel H1 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels E2 and G that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels E2 and G
Parcel H2	Construction of any new buildings on Parcel H2 over 80 feet in height, prior to any construction of new buildings on approximately 80% of the combined total parcel area of Parcels H1, E2, and E3 that would be completed by the estimated time of occupancy of the subject building, as estimated on or about the date of the building Schematic Design submittal.	Parcels H1, E2, and E3

Source: SWCA.

Requirements

A wind impact analysis shall be required prior to building permit issuance for any proposed new building that is located within the project site and meets the conditions described above. All feasible means (e.g., changes in design, relocating or reorienting certain building(s), sculpting to include podiums and roof terraces, adding architectural canopies or screens, or street furniture) to eliminate hazardous winds, if predicted, shall be implemented. After such design changes and features have been considered, the additional effectiveness of landscaping may also be considered.

1. Screening-level analysis. A qualified wind consultant approved by the Planning Department's Environmental Review Officer (ERO) shall review the proposed building design and conduct a "desktop review" in order to provide a qualitative result determining whether there could be a wind hazard. The screening-level analysis shall have the following steps: For each new building proposed that meets the criteria above, a qualified wind consultant shall review and compare the exposure, massing, and orientation of the proposed building(s) on the subject parcel to the building(s) on the same parcel in the representative massing models of the Proposed Project tested in the wind tunnel as part of this EIR and in any subsequent wind analysis testing required by this mitigation measure. The wind consultant shall identify and compare the potential impacts of the proposed building(s) to those identified in this EIR, subsequent wind testing that may have occurred under this mitigation measure, and to the City's wind hazard criterion. The wind consultant's analysis and evaluation shall consider the proposed building(s) in the context of the "Current Project Baseline," which, at any given time during construction of the Proposed Project, shall be defined as any existing buildings at the site, the as-built designs of all previously-completed structures and the then-current designs of approved but yet unbuilt structures that would be completed by the time of occupancy of the subject building.

   (a) If the qualified wind consultant concludes that the building design(s) could not create a new wind hazard and could not contribute to a wind hazard identified by prior wind tunnel testing for the EIR and in subsequent wind analysis required by this mitigation measure, no further review would be required. If there could be a new wind hazard, then a quantitative assessment shall be conducted using wind tunnel testing or an equivalent quantitative analysis that produces comparable results to the analysis methodology used in this EIR.

   (b) If the qualified wind consultant concludes that the building design(s) could create a new wind hazard or could contribute to a wind hazard identified by prior wind tunnel testing conducted for this EIR and in subsequent wind analysis required by this mitigation measure, but in the consultant's professional judgment the building(s) can be modified to reduce such impact to a less-than-significant level, the consultant shall notify the ERO and the building applicant. The consultant's professional judgment may be informed by the use of "desktop" analytical tools, such as computer tools relying on results of prior wind tunnel testing for the Proposed Project and other projects (i.e., "desktop" analysis does not include new wind tunnel testing). The analysis shall include consideration of wind location, duration, and speed of wind. The building applicant may then propose changes or supplements to the design of the proposed building(s) to achieve this result.

These changes or supplements may include, but are not limited to, changes in design, building orientation, sculpting to include podiums and roof terraces, and/or the addition of architectural canopies or screens, or street furniture. The effectiveness of landscaping may also be considered. The wind consultant shall then reevaluate the building design(s) with specified changes or supplements. If the wind consultant demonstrates to the satisfaction of the ERO that the modified design and landscaping for the building(s) could not create a new wind hazard or contribute to a wind hazard identified in prior wind tunnel testing conducted for this EIR and in subsequent wind analysis required by this mitigation measure, no further review would be required.

(c) If the consultant is unable to demonstrate to the satisfaction of the ERO that no increase in wind hazards would occur, wind tunnel testing or an equivalent method of quantitative evaluation producing results that can be compared to those used in the EIR and in any subsequent wind analysis testing required by this mitigation measure is required. The building(s) shall be wind tunnel tested in the context of a model that represents the Current Project Baseline, as described in Item 1, above. The testing shall include all the test points in the vicinity of a proposed building or group of buildings that were tested in this EIR, as well as all additional points deemed appropriate by the consultant to determine the wind performance for the building(s). Testing shall occur in places identified as important, e.g., building entrances, sidewalks, etc., and there may need to be additional test point locations considered. At the direction and approval of the Planning Department, the "vicinity" shall be determined by the wind consultant, as appropriate for the circumstances, e.g., a starting concept for "vicinity" could be approximately 350 feet around the perimeter of the subject parcel(s), subject to the wind consultant's reducing or increasing this radial distance. The wind tunnel testing shall test the proposed building design(s), as well as the Current Project Baseline, in order to clearly identify those differences that would be due to the proposed new building(s). In the event the wind tunnel testing determines that design of the building(s) would increase the hours of wind hazard or extent of area subject to hazardous winds beyond those identified in prior wind testing conducted for this EIR and in subsequent wind tunnel analysis required by this mitigation measure, the wind consultant shall notify the ERO and the building applicant. The building applicant may then propose changes or supplements to the design of the proposed building(s) to eliminate wind hazards. These changes or supplements may include, but are not limited to, changes in design, building orientation, sculpting building(s) to include podiums and roof terraces, adding architectural canopies or screens, or street furniture. All feasible means (changes in design, relocating or reorienting certain building(s), sculpting to include podiums and roof terraces, the addition of architectural canopies or screens, or street furniture) to eliminate wind hazards, if predicted, shall be implemented to the extent necessary to mitigate the impact. After such design changes and features have been considered, the additional effectiveness of landscaping at the size it is proposed to be installed may also be considered. The wind consultant shall then reevaluate the building design(s) with specified changes or supplements. If the wind consultant demonstrates to the satisfaction of the ERO that the modified design would not create a new wind hazard or contribute to a wind hazard identified in prior wind tunnel testing conducted for this EIR and in

subsequent wind analysis required by this mitigation measure, no further review would be required.

If the proposed building(s) would result in a wind hazard exceedance, and the only way to eliminate the hazard is to redesign a proposed building, then the building shall be redesigned.

Implementation of the steps required by Mitigation Measure M-WS-1 would reduce the exposure of pedestrians and cyclists to the effects of hazardous winds during phased build-out.[33] With implementation of Mitigation Measure M-WS-1, the potential impact would be reduced to a less-than-significant level.

Impact WS-2: For public open space built on rooftops, the Proposed Project would alter wind in a manner that affects those public open spaces. ***(Less than Significant with Mitigation)***

If Parcels C1 and C2 are developed with structured parking, public open space would be provided on the rooftops. Under the Maximum Residential Scenario and Maximum Commercial Scenario, the wind hazard criterion of Planning Code Section 148 would be exceeded on the rooftop of Building C1 at test point 143 for 1 hour per year. Under the Maximum Commercial Scenario - Pedestrian Passageway Option, test point 143 would have 2 hours of exceedance of the hazard criterion. In all three modeled instances, Building C1 was modeled at a maximum height of 90 feet. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-WS-2: Wind Reduction for Rooftop Winds.

Mitigation Measure M-WS-2: Wind Reduction for Rooftop Winds

If the rooftop of building(s) is proposed as public open space and/or a passive or active public recreational area prior to issuance of a building permit for the subject building(s), a qualified wind consultant shall prepare a wind impact and mitigation analysis in the context of the Current Project Baseline regarding the proposed architectural design. All feasible means (such as changing the proposed building mass or design; raising the height of the parapets to at least 8 feet, using a porous material where such material would be effective in reducing wind speeds; using localized wind screens, canopies, trellises, and/or landscaping around seating areas) to eliminate wind hazards shall be implemented as necessary. A significant wind impact would be an increase in the number of hours that the wind hazard criterion is exceeded or an increase in the area subjected to winds exceeding the hazard criterion as compared to existing conditions at the height of the proposed rooftop. The wind consultant shall demonstrate to the satisfaction of the ERO that the building design would not create a new wind hazard or contribute to a wind hazard identified in prior wind testing conducted for this EIR.

[33] "Desktop" analytical tools and approaches are discussed in H. Wu, C.J. Williams, H.A. Baker and W.F. Waechter, "Knowledge-based Desk-top Analysis of Pedestrian Wind Conditions," *Structures*, 2004, pp. 1-10.

Impact WS-3: At full build-out, the Proposed Project would not alter wind in a manner that substantially affects ground-level public areas. ***(Less than Significant)***

Maximum Residential Scenario

Under the Maximum Residential Scenario, no new hazardous wind locations would be created.

The wind hazards at the southwest corner of Building 66 (test point 199) under baseline conditions would be eliminated by the Maximum Residential Scenario, because Building 66 would be demolished as part of the Proposed Project. The baseline conditions wind hazard exceedance at Building 103, just north of the project site (test point 54), would also be eliminated.

The pedestrian comfort criterion is not considered within the CEQA significance threshold; however, improvement measures are suggested below to improve the suitability and usability of public open spaces and further reduce this less-than-significant impact. City decision-makers may choose to impose these improvement measures on the Proposed Project as conditions of approval.

Maximum Commercial Scenario

Under the Maximum Commercial Scenario and the Maximum Commercial Scenario - Pedestrian Passageway Option, no new hazardous wind locations would be created that would affect public areas. The exception would be the parking structure option, as described under Impact WS-2.

The hazardous wind condition at the southwest corner of Building 66 (test point 199) under baseline conditions would be eliminated by the Maximum Commercial Configuration, because Building 66 would be demolished as part of the Proposed Project.

The baseline conditions wind hazards at Building 103 (test point 54), beyond the northern edge of the 28-Acre Parcel, would continue under the Maximum Commercial Scenario, which would represent a continuation of baseline conditions. The Maximum Commercial Scenario would increase the number of hours per year of exceedance from 2 hours to 5 hours at test point 54. It would not create any new wind hazard exceedance.

The pedestrian comfort criterion is not considered within the CEQA significance threshold; however, Improvement Measures I-WS-3a: Wind Reduction for Public Open Spaces and Pedestrian and Bicycle Areas; I-WS-3b: Wind Reduction for Waterfront Promenade and Waterfront Terrace; I-WS-3c: Wind Reduction for Slipways Commons; I-WS-3d: Wind Reduction for Building 12 Market Plaza and Market Square; I-WS-3e: Wind Reduction for Irish Hill Playground; and I-WS-3f: Wind Reduction for 20th Street Plaza are suggested below to improve the comfort, suitability, and usability of public open spaces and further reduce this less

than significant impact. City decision makers may choose to impose these improvement measures on the Proposed Project as conditions of approval.

Improvement Measure I-WS-3a: Wind Reduction for Public Open Spaces and Pedestrian and Bicycle Areas

For each development phase, a qualified wind consultant should prepare a wind impact and mitigation analysis regarding the proposed design of public open spaces and the surrounding proposed buildings. Feasible means should be considered to improve wind comfort conditions for each public open space, particularly for any public seating areas. These feasible means include horizontal and vertical, partially-porous wind screens (including canopies, trellises, umbrellas, and walls), street furniture, landscaping, and trees. Specifics for particular public open spaces are set forth in Improvement Measures I-WS-3b to I-WS-3f.

Any proposed wind-related improvement measure should be consistent with the design standards and guidelines outlined in the *Pier 70 SUD Design for Development*.

Improvement Measure I-WS-3b: Wind Reduction for Waterfront Promenade and Waterfront Terrace

The Waterfront Promenade and Waterfront Terrace would be subject to winds exceeding the pedestrian wind comfort criteria. A qualified wind consultant should prepare written recommendations of feasible means to improve wind comfort conditions in this open space, emphasizing vertical elements, such as wind screens and landscaping. Where necessary and appropriate, wind screens should be strategically placed directly around seating areas. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous material. Design of any wind screen or landscaping shall be compatible with the Historic District.

Improvement Measure I-WS-3c: Wind Reduction for Slipways Commons

The central and western portions of Slipways Commons would be subject to winds exceeding the pedestrian wind comfort criteria. Street trees should be considered along Maryland Street, particularly on the east side of Maryland Street between Buildings E1 and E2. Vertical elements such as wind screens would help for areas where street trees are not feasible. Where necessary and appropriate, wind screens should be strategically placed to the west of any seating areas. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous material. Design of any wind screen or landscaping shall be compatible with the Historic District.

Improvement Measure I-WS-3d: Wind Reduction for Building 12 Market Plaza and Market Square

Building 12 Market Plaza and Market Square would be subject to winds exceeding the pedestrian wind comfort criteria. For reducing wind speeds in the public courtyard between Buildings 2 and 12, the inner south and west façades of Building D-1 could be stepped by at least 12 feet to direct downwashing winds above pedestrian level. Alternatively, overhead protection should be used, such as a 12-foot-deep canopy along the inside south and west façades of Building D-1, or localized trellises or umbrellas over seating areas. For reducing wind speeds on the eastern and southern sides of Building 12,

street trees should be considered, along Maryland and 22nd streets. Smaller underplantings should be combined with street trees to reduce winds at pedestrian level. Design of any wind screen or landscaping shall be compatible with the Historic District.

Improvement Measure I-WS-3e: Wind Reduction for Irish Hill Playground

The Irish Hill Playground would be subject to winds exceeding the pedestrian wind comfort criteria. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous material. Design of any wind screen or landscaping shall be compatible with the Historic District.

Improvement Measure I-WS-3f: Wind Reduction for 20th Street Plaza

The 20th Street Plaza would be subject to winds exceeding the pedestrian wind comfort criteria. A qualified wind consultant should prepare written recommendations of feasible means to improve wind comfort conditions in this open space, emphasizing hardscape elements, such as wind screens, canopies, and umbrellas. Where necessary and appropriate, wind screens should be strategically placed to the northwest of any seating area. For maximum benefit, wind screens should be at least 6 feet high and made of approximately 20 to 30 percent porous material. If there would be seating areas directly adjacent to the north façade of the PKN Building, localized canopies or umbrellas should be used. Design of any wind screen or landscaping shall be compatible with the Historic District.

Cumulative Impacts

Impact C-WS-1: The Proposed Project at full build-out, when combined with other cumulative projects, would not alter wind in a manner that substantially affects public areas within the vicinity of the project site. ***(Less than Significant)***

For the analysis of cumulative wind impacts, the development projects within 1,600 feet from a point approximately 400 feet to the west of the center of the project site were analyzed.[34] In theory, cumulative project winds can increase or reduce impacts, depending on the specifics (e.g., height and proximity of buildings, location in context of predominant wind directions, etc.), especially the proximity of the cumulative projects to the Proposed Project. However, cumulative projects along with the Proposed Project could result in an increased number of buildings that would collectively act as obstacles that would reduce wind speeds in the project site vicinity. The results of the wind tunnel analysis are summarized below.

Maximum Residential Scenario Plus Cumulative Projects

Under the Maximum Residential Scenario plus cumulative projects, the wind tunnel test results are very similar to those for the Maximum Residential Scenario. Figure 4.I.6: Pedestrian Wind

[34] Image 1 and the table on p. 4 of the Pedestrian Wind Study show the cumulative projects analyzed.

Comfort and Hazard Conditions - Maximum Residential Scenario Plus Cumulative, p. 4.I.65, shows the pedestrian wind comfort conditions for this configuration.

Under the Maximum Residential Scenario plus cumulative projects, the average wind speed is 11 mph. (This is 1 mph less than the average under the Maximum Residential Scenario.) The range of wind speeds is from 7 to 19 mph. Under Maximum Residential Scenario plus cumulative projects, 133 of the 248 test locations comply with the comfort criterion, and 115 do not.

The wind hazard criterion of Planning Code Section 148 would not be exceeded at any test locations under the Maximum Residential Scenario plus cumulative projects. No mitigation measures are necessary.

Maximum Commercial Scenario Plus Cumulative Projects

Under the Maximum Commercial Scenario plus cumulative projects, the wind tunnel test results are very similar to the Maximum Commercial Scenario. Figure 4.I.7: Pedestrian Wind Comfort and Hazard Conditions - Maximum Commercial Scenario Plus Cumulative, p. 4.I.67, shows the pedestrian wind comfort conditions for this configuration.

Under the Maximum Commercial Scenario plus cumulative projects, the average wind speed is 11 mph. (This is the same as the average under the Maximum Commercial Scenario.) The range of wind speeds is from 7 to 19 mph. Under the Maximum Commercial Scenario plus cumulative projects, 134 of the 247 test locations comply with the comfort criterion, and 113 do not.

The Pedestrian Passageway Option did not need to be tested in the wind tunnel with cumulative projects because there are not any cumulative projects to the south of the project site close enough to affect the wind test results.

The wind hazard criterion of Planning Code Section 148 would not be exceeded at any test locations under the Maximum Commercial Scenario plus cumulative projects. No mitigation measures are necessary.



Source: RWDI, Pedestrian Wind Study.

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.6: PEDESTRIAN WIND COMFORT AND HAZARD CONDITIONS – MAXIMUM RESIDENTIAL SCENARIO PLUS CUMULATIVE

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Source: RWDI, Pedestrian Wind Study.

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.7: PEDESTRIAN WIND COMFORT AND HAZARD CONDITIONS – MAXIMUM COMMERCIAL SCENARIO PLUS CUMULATIVE

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SHADOW

The Shadow subsection discusses the shadow impacts of the Proposed Project on open spaces and recreation facilities in the vicinity of the project site. The Environmental Setting discussion identifies the existing and planned publicly accessible open spaces and recreation facilities in the vicinity of the project site that could potentially be affected by the Proposed Project; identifies applicable regulations related to shadow impacts; and summarizes the regulatory framework related to the topic of Shadow.

The Impacts discussion, pp. 4.I.72-4.I.112, describes whether the Proposed Project would cast shadow on parks and open spaces in the vicinity of the project site in such a manner as to reduce the use and enjoyment of those spaces. For informational purposes, this discussion also describes shadow impacts of new buildings under the Proposed Project on proposed public open space that is included as part of the Proposed Project. The Impacts discussion also describes the cumulative effects of the Proposed Project, combined with past, present, and reasonably foreseeable future projects.

The potential extent of shadow impacts of the Proposed Project is based on a shadow fan diagram prepared by the Planning Department that projects the maximum reach of project shadow throughout an entire year one hour after sunrise and one hour before sunset.[35] The analysis is based on a digital shadow analysis prepared by an independent consultant that shows the location of project shadow on existing and planned public open spaces on and in the vicinity of the Proposed Project at representative times of the year throughout the day between one hour after sunrise to one hour before sunset (see "Approach to Analysis," pp. 4.I.73-4.I.75).[36]

ENVIRONMENTAL SETTING

PUBLICLY ACCESSIBLE OPEN SPACES IN THE VICINITY OF THE PROPOSED PROJECT

There are no existing publicly accessible open space areas within the project site.

There are three existing publicly accessible open spaces within a 0.25-mile vicinity of the project site boundary, listed below. (These open spaces are shown on Figure 4.J.1: Existing, Baseline, and Future Parks and Recreational Facilities, in Section 4.J, Recreation, p. 4.J.8.)

- Esprit Park is three blocks to the west of the project site along the northern side of 20th Street at Minnesota Street. It is an approximately 1.8-acre field bordered with picnic

[35] The Planning Department's shadow fan for the Proposed Project, dated January 30, 2015.
[36] PreVision Design, Pier 70 Project Shading Analysis, May 31, 2016.

tables, benches, and redwood trees. It is owned and managed by the San Francisco Parks and Recreation Department.

- Warm Water Cove Park is south of the project site along the waterfront at the eastern terminus of 24th Street. It is an approximately 1.85-acre open space. It is owned by the Port of San Francisco.
- Woods Yard Park is three blocks to the west of the project site along the southern side of 22nd Street at Minnesota Street. It is an approximately 0.25-acre site located with two grassy areas, shade trees, and a sand pit. It is owned by the San Francisco Municipal Transit Authority.

There is one planned publicly accessible Port of San Francisco-owned open space on Pier 70 adjacent to the project site.

- The planned Historic Core Plaza would be an approximately 45,000-sq.-ft. plaza south of Building 113 and east of Buildings 114, 115, and 116. It would be constructed as part of the adjacent 20th Street Historic Core Project. The primary pedestrian access to the plaza would be from 20th Street through an atrium within Building 113. It would also be accessible from the project site from the south and east.

The following publicly accessible Port of San Francisco-owned open space is under construction on Pier 70 north of the project site.

- The future Crane Cove Park is an approximately 9-acre site north of the project site within Pier 70. It is bounded by Illinois Street to the east, Mariposa Street to the north, San Francisco Bay to the east, and the future continuation of 19th Street to the south. The planned park would include a variety of landscape and plaza areas; 1,000 feet of San Francisco Bay shoreline open to the public; adaptive reuse of historic resources, including Slipway 4 and two cranes; and views of the dry dock, City skyline, and San Francisco Bay.[37] The site is owned by the Port of San Francisco, which will own and operate the park. Phase I (which consists of most of the western portion of the site and the extension of 19th Street) is anticipated to be completed in late 2017.[38] Later phases within the eastern portion are anticipated to be completed 5 to 10 years later.

REGULATORY FRAMEWORK

SAN FRANCISCO GENERAL PLAN

The *General Plan* contains objectives and policies that are related to preserving sunlight on open spaces and other public areas. These objectives and policies are found in the Recreation and Open Space Element and the Urban Design Element.

[37] Port of San Francisco, Crane Cove Park, December 2015. Available online at http://www.sfport.com/index.aspx?page=2025. Accessed December 15, 2015.

[38] Port of San Francisco, Crane Cove Park, Project Status, October 2015. Available online at http://sfport.com/sites/default/files/FileCenter/Documents/10509-Plan%20%26%20Perspectives-%20web%20.pdf. Accessed June 28, 2016.

Recreation and Open Space Element

The Recreation and Open Space Element states that solar access to public open space should be protected.[39] In San Francisco, the presence of the sun's warming rays is essential to enjoying open space. This is because climatic factors, including ambient temperature, humidity, and wind, usually combine to create a comfortable climate only when direct sunlight is present. Therefore, the shadows created by new development nearby can critically diminish the utility of the open space.

Urban Design Element

The Urban Design Element states that buildings to the south, east, and west of parks and plazas should be limited in height or effectively oriented so as not to prevent the penetration of sunlight to such parks and plazas. Large buildings and developments should, where feasible, provide ground-level open space on their sites, well situated for public access and for sunlight penetration.[40]

SAN FRANCISCO PLANNING CODE

Planning Code Section 101.1 / Proposition M

In November 1986, the voters of San Francisco approved Proposition M (the Accountable Planning Initiative), which added Section 101.1 to the Planning Code and established eight Priority Policies. These Priority Policies are the basis upon which inconsistencies with the *General Plan* are resolved. Priority Policy No. 8 calls for the protection of parks and open space and their access to sunlight and vistas.

Prior to issuing a permit for any project which requires an Initial Study under CEQA; prior to issuing a permit for any demolition, conversion, or change of use; and prior to taking any action which requires a finding of consistency with the *General Plan*, the City is required to find that the Proposed Project or legislation would be consistent with the Priority Policies.

Planning Code Section 295 / Proposition K

In 1984, San Francisco voters approved an initiative known as "Proposition K, The Sunlight Ordinance," which was codified in 1985 as Planning Code Section 295. Section 295 prohibits the

[39] City and County of San Francisco, *General Plan*, Recreation and Open Space Element, April 2014, p. 18. Available online at http://www.sf-planning.org/ftp/General_Plan/Recreation_OpenSpace_Element_ADOPTED.pdf. Accessed January 4, 2016.

[40] City and County of San Francisco, *General Plan*, Urban Design Element, April 2014, p. 18. Available online at http://www.sf-planning.org/ftp/general_plan/I5_Urban_Design.htm. Accessed January 4, 2016.

approval of "any structure that would cast any shade or shadow upon any property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission" unless the Planning Commission, upon the recommendation of the General Manger of the Recreation and Park Department and after review and comment by the Recreation and Park Commission, has found that the shadows cast by a proposed project would not have an adverse impact on the use of the property. Section 295 does not apply to structures that do not exceed 40 feet in height. The period analyzed is from the first hour after sunrise until the last hour before sunset.

On February 7, 1989, pursuant to Proposition K, the Planning Commission and the Recreation and Park Commission adopted a joint resolution adopting criteria for determination of significant shadows in 14 Downtown parks, as described in a February 3, 1989, memorandum to the Planning Commission and the Recreation and Park Commission regarding "Proposition K, The Sunlight Ordinance."[41] These criteria establish an "absolute cumulative limit" (ACL) for new shadow allowed on these parks, as well as qualitative criteria for allocating the ACL among individual development projects. As discussed below, no properties under the jurisdiction of the Recreation and Park Commission are on the project site nor within the potential reach of Proposed Project shadow. As such, Planning Code Section 295 does not apply to the Proposed Project.

Planning Code Sections 146 and 147

Other Planning Code sections related to shadow, such as Sections 146 and 147, apply to certain zoning districts, with the intent to maintain direct sunlight on public sidewalks in certain downtown areas during critical periods of use and to minimize shadow on public plazas or other publicly accessible open spaces other than those protected by Section 295. The Pier 70 project site is not in zoning districts that are subject to the provisions of Planning Code Sections 146 and 147.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The threshold for determining the significance of impacts in this analysis is consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable threshold was used to determine whether implementing the Proposed Project would result in a significant shadow impact. Implementation of the Proposed Project would have a significant shadow effect if the project would:

[41] City and County of San Francisco Planning Department, Memorandum to the Planning Commission and Recreation and Park Commission, "Proposition K, The Sunlight Ordinance," February 3, 1989.

- Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas.

"Outdoor recreation facilities or other public areas" studied in this section include planned baseline and future Port of San Francisco open spaces within the potential reach of project shadow and nearby public sidewalks. Shadow impacts on open spaces proposed as part of the Proposed Project are evaluated for informational purposes.

APPROACH TO ANALYSIS

Shadow Fan

In order to determine whether any outdoor recreation facilities or other public open spaces could be potentially affected by project shadow, the Planning Department prepared a "shadow fan" diagram. The shadow fan plots the maximum potential reach of project shadow over the course of a year (from one hour after sunrise until one hour before sunset on each day of the year) and plots the locations of nearby open spaces, recreation facilities, and parks. The shadow fan accounts for topographical changes but it does not account for existing shadows cast by existing buildings. The shadow fan is used by the Planning Department as the basis for initially identifying which open spaces, recreation facilities, and parks merit further study. Those that are outside the maximum potential reach of project shadow do not require further study.

Based on the shadow fan for the Proposed Project, the adjacent future Historic Core Plaza that is part of baseline conditions and the southernmost portion of the future Crane Cove Park, to the north of the project site, could be potentially within the reach of project shadow. No other off-site publicly accessible open spaces in the vicinity of the project site are within the potential reach of project shadow.

Based on the shadow fan for the Proposed Project, shadow from the Proposed Project could not reach any property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission from one hour after sunrise to one hour before sunset at any time during the year. For this reason, quantification of new project shadow, a method for analyzing shadow impacts on Recreation and Park properties, is not necessary for the Proposed Project.

Shadow Model and Assumptions

An independent consultant prepared a digital shadow model of the Proposed Project at full build-out. Specific architectural designs for buildings within the project site are not available at this time. The Proposed Maximum Height Plan does not specify the exact massing and location of the future proposed buildings, but shows the proposed maximum distribution of building heights across the project site (ranging from 50 to 90 feet high). The height plan would be the same for every parcel under both the Maximum Residential Scenario and the Maximum Commercial

Scenario and therefore serves to cover maximum building volume on each parcel under both scenarios. To understand the worst-case scenario, this analysis of shadow impacts assumes full build-out under the height plan shown in Figure 2.13: Proposed Height Limits Plan, in Chapter 2, Project Description, p. 2.40, and assumes building volumes that are built to the maximum height and cover the entire footprint of each parcel. The model adds an additional 16 feet of height above the maximum height for each parcel to account for rooftop mechanical features which would be exempt (under Planning Code Section 260(b)) from the proposed maximum heights limits. The model accounts for the proposed grading of the project site to address sea level rise. It addresses Grading Option 3 for Building 12, which involves raising the grade of the rehabilitated building to the proposed new grade and therefore would have the greatest potential reach of shadow of the three grading options.

Shadows from existing buildings to be retained and rehabilitated are shown as existing shadow on the diagrams; shadows of existing buildings on the project site that are to be demolished to construct the Proposed Project are not shown in the diagrams. For these reasons, this analysis represents a conservative disclosure of shadow impacts (i.e., one that may overstate, rather than understate, new project shadow). Project phasing of development of open space is not separately discussed. The proposed new 20th Street Pump Station that would be built at an off-site location (west of Building 6 in the BAE Systems parking lot) is not modeled; it would not cast new shadow on any open space.

Project shadows are superimposed on the outlines of affected existing and proposed off-site public open space areas, as well as the proposed public open spaces within the project site, to evaluate the effect of project shadow on existing and planned public open spaces in the vicinity as well as proposed public open spaces to be developed as part of the Proposed Project.

Shadow Diagrams

From the digital shadow model, the shadow diagrams graphically depict the movement of project shadows across the project site and surrounding area on four representative days of the year from one hour after sunrise to one hour before sunset: the summer solstice (June 21, the longest day of the year, when the sun is highest in the sky and shadows are the shortest at any given time of day); the spring/autumn equinoxes (March 20/September 22, when the sun's position is nearly identical to the opposite equinox and represent the midway point between the winter and summer solstices); and the winter solstice (December 21, the shortest day of the year, when the sun is lowest in the sky and shadows are the longest at any given time of day).

For each of these days (summer solstice, spring/autumn equinoxes, and winter solstice), this section presents representative shadow diagrams at five times of day: one hour after sunrise; the beginning, middle, and end of the midday period of peak use (10:00 a.m., 12:00 p.m., and 3:00

p.m.); and one hour before sunset. Presenting a series of shadow diagrams from the same day demonstrates how shadow moves across the space and expands and contracts over a specific period of time. While these are not the only times of day and year when shadows occur, they represent times of peak midday use of open space on the longest day of the year, on the equinoxes (when day and night are of approximately equal length), and on the shortest day of the year. From these shadow diagrams, shadow impacts on particular open spaces are described and evaluated.

Features of the Proposed Project that could have an effect on shadows include proposed grading, the location and allowable height and bulk of buildings, and the location and character of proposed open space within the project site, as described below under "Project Features." The features are the same or substantially similar under the Maximum Residential Scenario and the Maximum Commercial Scenario, and under the three options for sewer/wastewater treatment that are analyzed in this EIR. To the extent that these features may differ somewhat from one to another, they are generally included and accounted for in an analysis of maximum building massing within the project site, and the maximum grading option for Building 12. The same regulatory requirements and mitigation measures applicable to the Proposed Project are equally applicable under the Proposed Project's scenarios and options. Therefore, this impact analysis of shadow impacts applies to both scenarios, and no separate analysis of impacts under each scenario or option is necessary.

On-Site Open Space Included as Part of the Proposed Project

The project site does not currently contain any developed or accessible public open space, but public open space would be constructed within the project site as part of the Proposed Project. Since these open spaces do not yet exist, project shadow on these open spaces would not interfere with any existing recreational use that may rely on access to sunlight and would have no impact under CEQA. The Impacts discussion in this section describes and evaluates shadow that would be cast by the Proposed Project on public open space to be constructed within the project site as part of the Proposed Project and is provided for informational purposes only.

PROJECT FEATURES

Building Locations and Maximum Building Heights

The proposed Pier 70 SUD would include amendments to the *General Plan* and Planning Code that would establish the height and bulk district on the project site. The existing height and bulk district on the 28-Acre Site is 40-X; the proposed amendments to the *General Plan* and Planning Code would include an amendment to change the existing 40-X Height and Bulk District to 90-X, except for a 100-foot-wide portion adjacent to the shoreline, which would remain at 40-X. (See Figure 2.13: Proposed Height Limits Plan, in Chapter 2, Project Description, p. 2.40.) Maximum

building heights would be generally 50, 65, 70, and 90 feet, depending on location. Buildings up to 90 feet in height could generally be constructed along the southern and northern perimeters. At the center and eastern portions of the site, new buildings would be limited to heights between 50 to 70 feet.

The existing height and bulk districts on the Illinois Parcels are 65-X along the western end of the project site, and 40-X within the eastern portion of the Hoedown Yard. The proposed amendments to the *General Plan* and Planning Code would include an amendment to change the existing 40-X Height and Bulk District to 65-X. Proposed building locations on the 20th/Illinois portion of the site would front Illinois Street and the new 21st Street. Proposed development on the Hoedown Yard would front Illinois Street and the southern property line adjacent to 22nd Street.

Rehabilitated Building 2, in the central portion of the 28-Acre Site, would be retained at its existing height of approximately 80 feet. Rehabilitated Building 12, which is approximately 60 feet tall, would remain in place under Grading Option 3. Existing Building 21, which is about 45 feet tall, would be moved about 75 feet southeast from its current location to a new site just north of the proposed Slipways Commons open space. Relocated Building 21 would be framed by new 90-, 65-, and 50-foot-tall buildings to the west, north, and east, respectively.

Proposed Open Space Plan

The Proposed Project would construct 9 acres of publicly owned open space. (See Figure 2.15: Proposed Open Space Plan, in Chapter 2, Project Description, p. 2.46.) Open spaces included as part of the Proposed Project under both the Maximum Residential Scenario and Maximum Commercial Scenario would be the Waterfront Promenade, Waterfront Terrace, Slipways Commons, Building 12 Market Plaza and Market Square, Irish Hill Playground, and 20th Street Plaza. These open spaces are described below; however, they are not yet fully programmed. If parking is developed on Parcels C1 and/or C2, public open space would be built on the building rooftops.

Waterfront Promenade

The Waterfront Promenade would encompass a portion of an approximately 5-acre waterfront park area (which includes the Waterfront Terrace open spaces area, described below) located along the central and southern shoreline of the project site. The Waterfront Promenade would include a north-south running pedestrian and bicycle promenade as part of the 20-foot-wide Blue Greenway and Bay Trail system. To provide opportunities for waterfront viewing and passive recreation, anticipated features within the Waterfront Promenade include a café terrace north and east of Parcel E3, and furnished picnic and seating terraces east of Parcels E3 and H2. A 6-foot-wide shoreline trail would run parallel to the rip-rap along the water's edge and would connect the various features at the San Francisco Bay edge. The Pier 70 slipway structures along the

waterfront's edge would also be made accessible and would offer opportunities for fishing and bayfront viewing. The Waterfront Promenade installation would include two of the four viewing pavilions planned for the project site, which would be designed to accommodate a variety of public program uses.

Waterfront Terrace

The Waterfront Terrace would be constructed along the northern half of the project site's shoreline, just to the north of the Waterfront Promenade, and orient views towards the areas of active and historic shipbuilding activities north of the project site. The Waterfront Terrace includes three primary spaces: a third viewing pavilion to the north, a social lawn along the central portion, and an eating/drinking area (beer garden) along the southern portion, which would include picnicking, seating, and food and beverage operations. The Waterfront Terrace would also include a portion of the 20-foot-wide, north-south running Blue Greenway and Bay Trail system along the water's edge.

Slipways Commons

The Slipways Commons installation would be the central open space of the project site, intended to connect rehabilitated Buildings 2, 12, and 21 to the waterfront, and would be designed to accommodate community gatherings, festivals, performances, art installations, and nighttime and cultural events. Anticipated features include a café terrace, an event pavilion, and the last of the four viewing pavilions planned for the project site.

Building 12 Market Plaza and Market Square

Market Square would be primarily located directly north and east of historic Buildings 2 and 12. The approximately 1.5-acre plaza and square would provide opportunity for ground-floor uses within these two buildings to extend outside. Anticipated features within this planned courtyard include flexible space for open-air markets, market stalls, and small performances and gatherings. Directly south of Building 12, a potential café terrace is anticipated in the open space partially framed by the metal frame remnant of Building 15.

Irish Hill Playground

The Irish Hill Playground installation would be a 2-acre area adjacent to the south and east of the existing remnant of Irish Hill. The playground would include children's play areas (play slope and play pad), a seating area, a picnic grove, a lounging terrace, and planted slopes and pathways. The multi-trunk trees adjacent to Irish Hill Playground would remain.

20th Street Plaza

The 0.5-acre 20th Street Plaza open space area would be located at the southeast corner of the 20th and Illinois streets intersection, directly north of Parcel PKN. This gateway space would allow for direct views into Pier 70's Historic Core, specifically historic Building 113. Anticipated features within the 20th Street Plaza include terraced seating areas, and a stormwater garden terrace for infiltration of rainwater.

Structured Parking Rooftop Open Space

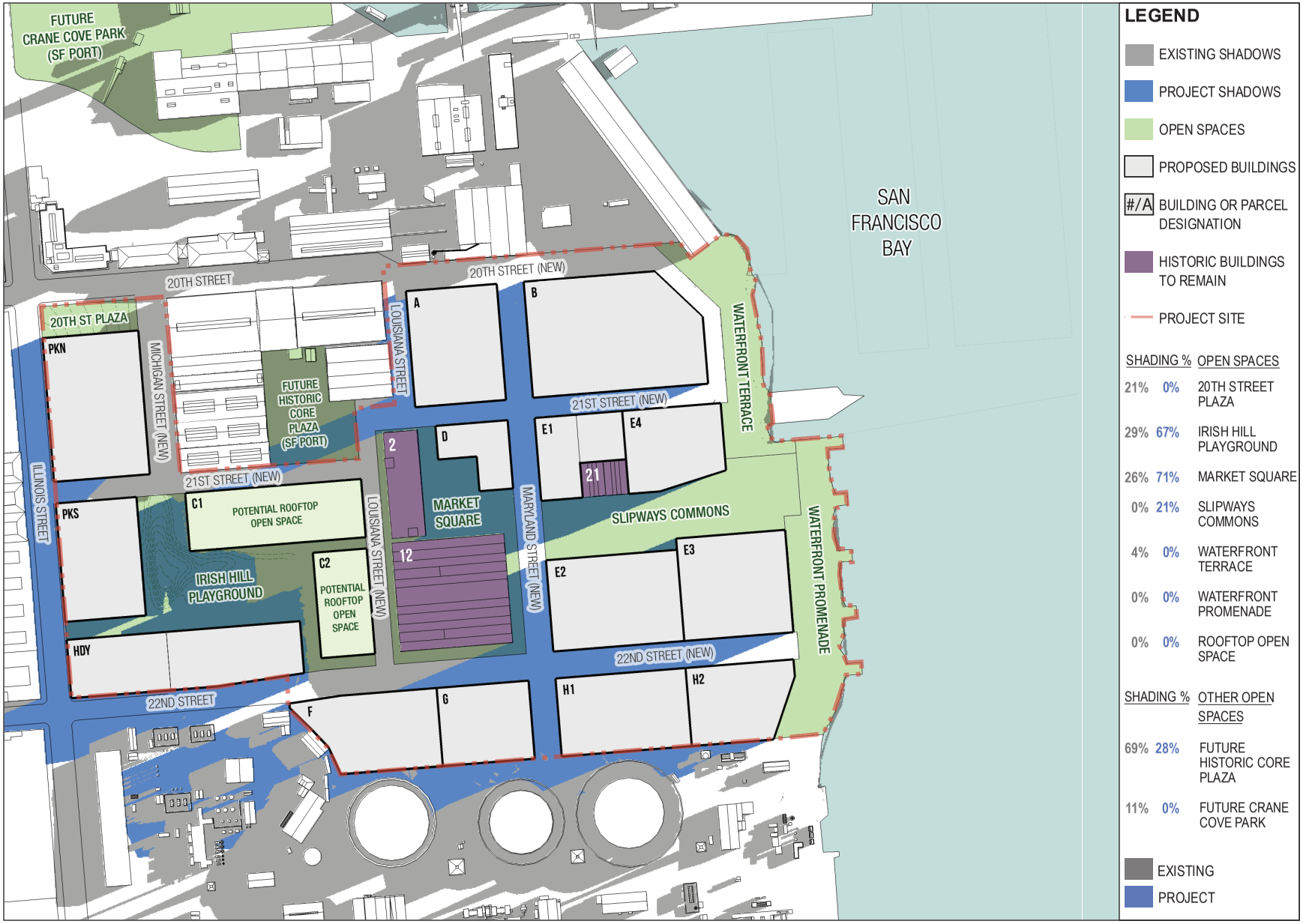
If constructed as district parking, the rooftops of structures on Parcels C1 and C2 would provide public open space in addition to the 9 acres. These open spaces are anticipated to be designed to offer active recreation (sports courts and play fields), along with community garden, seating, and observational terrace areas.

IMPACT EVALUATION

Impact WS-4: The Proposed Project would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas. (*Less than Significant*)

There are no existing outdoor recreation facilities or other publicly accessible open spaces within the potential reach of project shadow. Historic Core Plaza, part of the 20th Street Historic Core Project and adjacent to the project site, is currently under construction, as is the future Crane Cove Park along the shoreline north of the Historic Core. As potentially affected recreational facilities, both of these parks are being treated as if they already exist. Sidewalks in the vicinity of the project site and San Francisco Bay are also considered affected public areas for the purposes of this discussion of shadow impacts on recreation facilities and public areas. Seven proposed publicly accessible open spaces that are included within the project site as part of the Proposed Project are not considered part of the existing environment but are discussed for informational purposes.

Presented on the following pages are 15 diagrams showing four representative days of the year (June 21 [the summer solstice], March 20/September 22 [the spring and autumn equinoxes], and December 21 [the winter solstice]), each at five representative times of day (one hour after sunrise, 10:00 a.m., 12:00 p.m., 3:00 p.m., and one hour before sunset). The summer solstice times and equinox times are shown in Pacific Daylight Time (PDT). The winter solstice times are shown in Pacific Standard Time (PST). Figures 4.I.8 through 4.I.12 show shadow on June 21, the summer solstice; Figures 4.I.13 through 4.I.17 show shadow on March 20/September 22, the spring and autumn equinoxes; and Figures 4.I.18 through 4.I.22 show shadow on December 21, the winter solstice.



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.8: PROJECT SHADOW AT 6:48 AM (PDT) ON THE SUMMER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

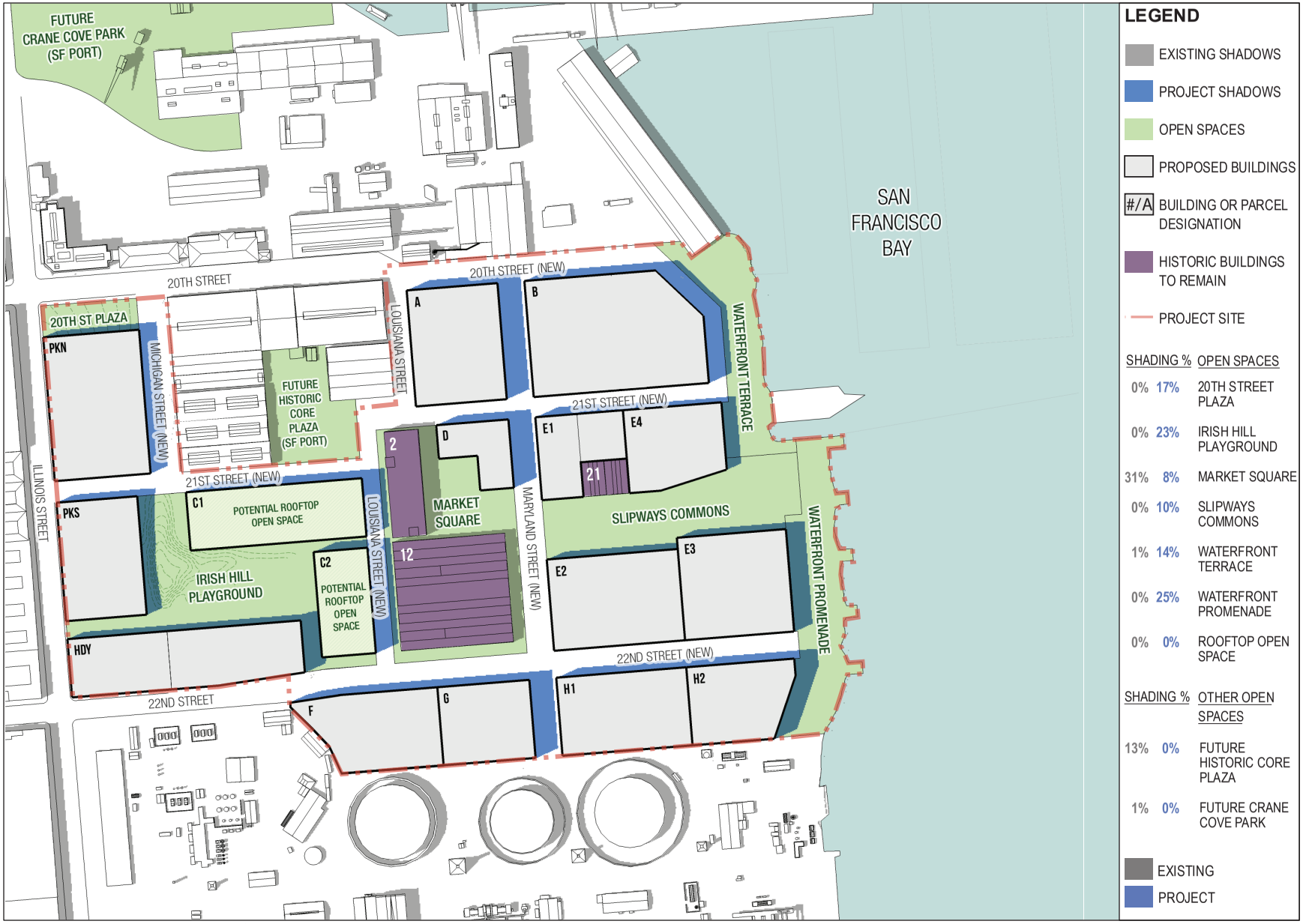
FIGURE 4.1.9: PROJECT SHADOW AT 10:00 AM (PDT) ON THE SUMMER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.10: PROJECT SHADOW AT 12:00 PM (PDT) ON THE SUMMER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

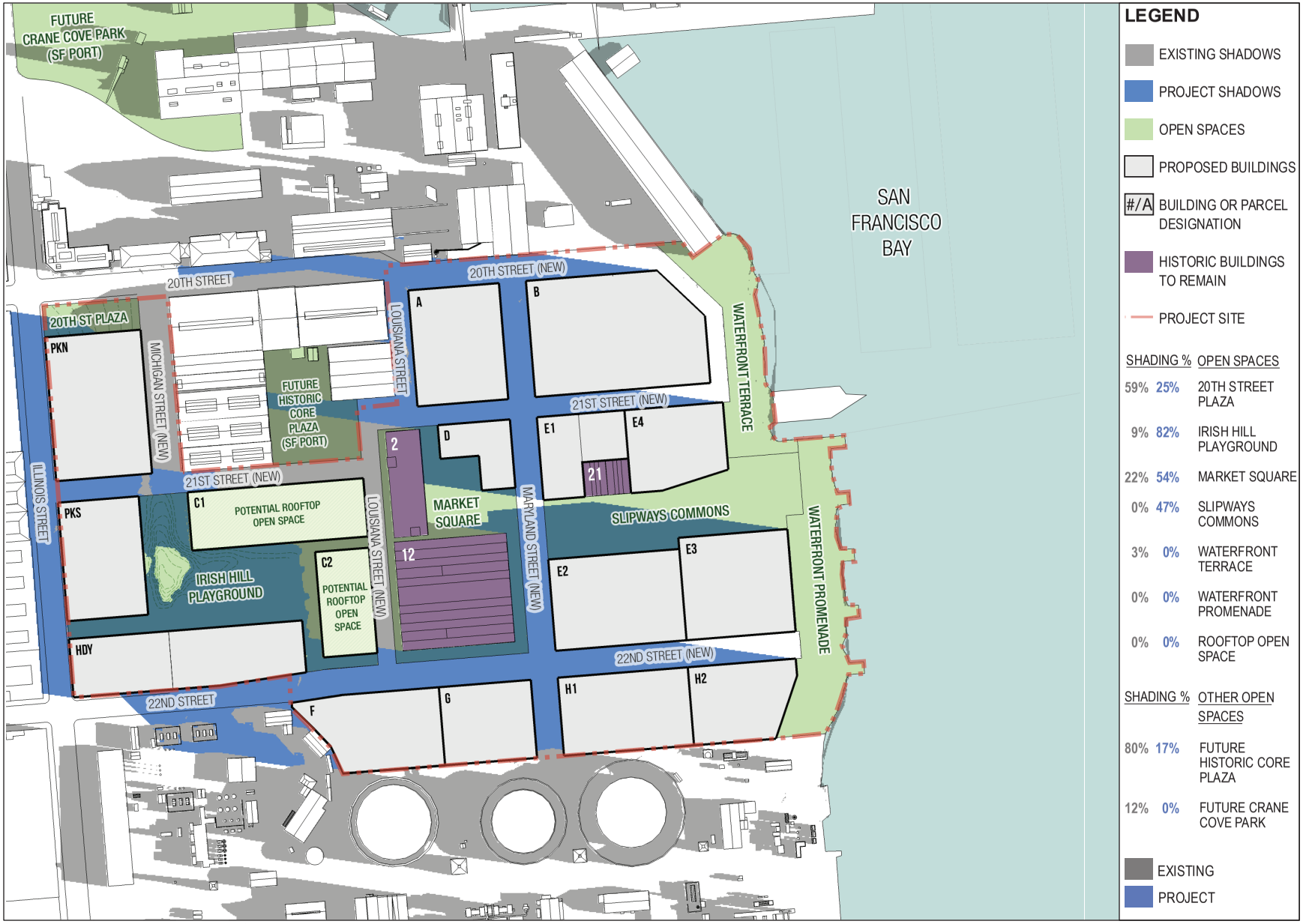
FIGURE 4.I.11: PROJECT SHADOW AT 3:00 PM (PDT) ON THE SUMMER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.12: PROJECT SHADOW AT 7:35 PM (PDT) ON THE SUMMER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

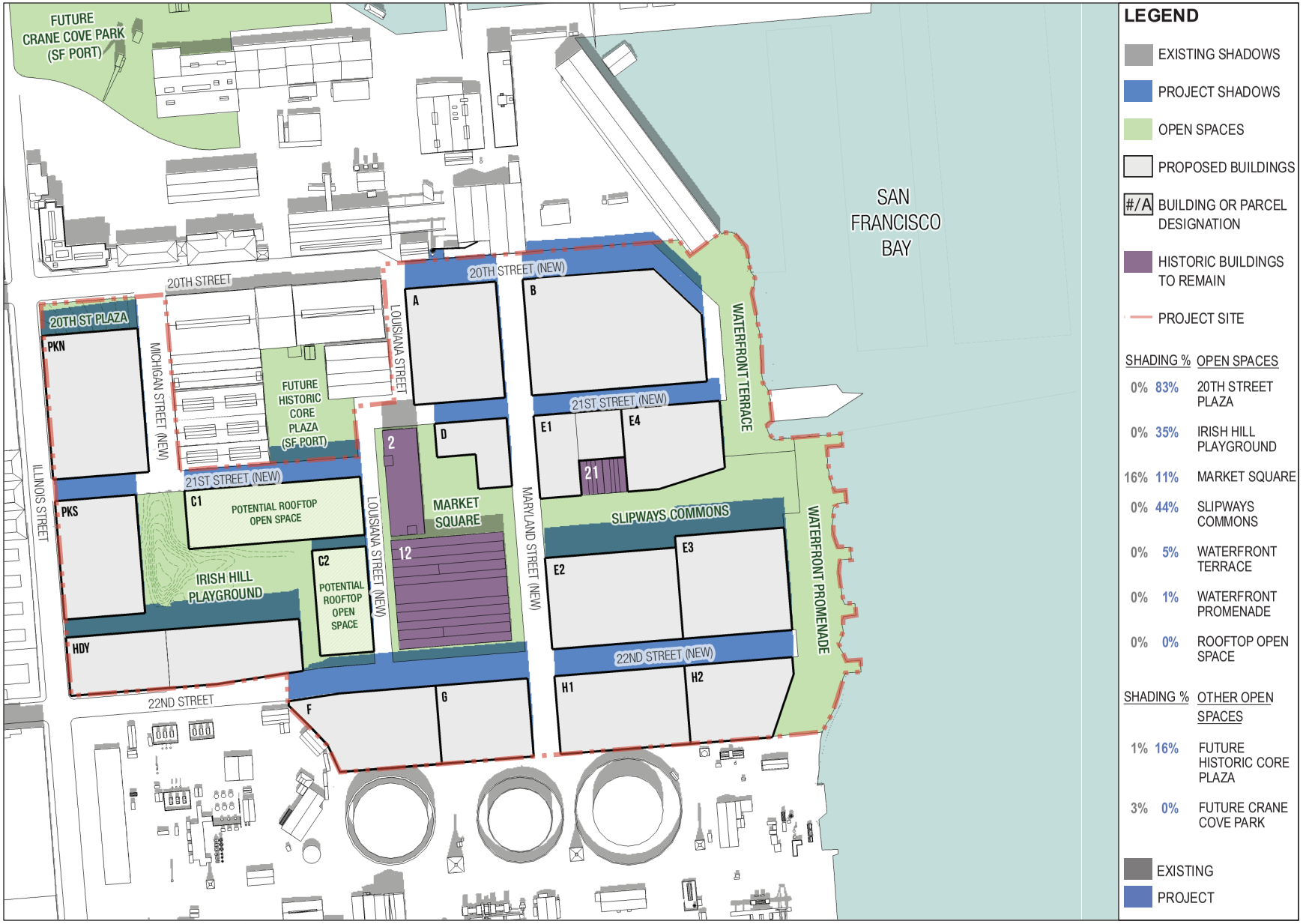
FIGURE 4.I.13: PROJECT SHADOW AT 6:58 AM (PDT) ON THE EQUINOXES



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.I.14: PROJECT SHADOW AT 10:00 AM (PDT) ON THE EQUINOXES



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

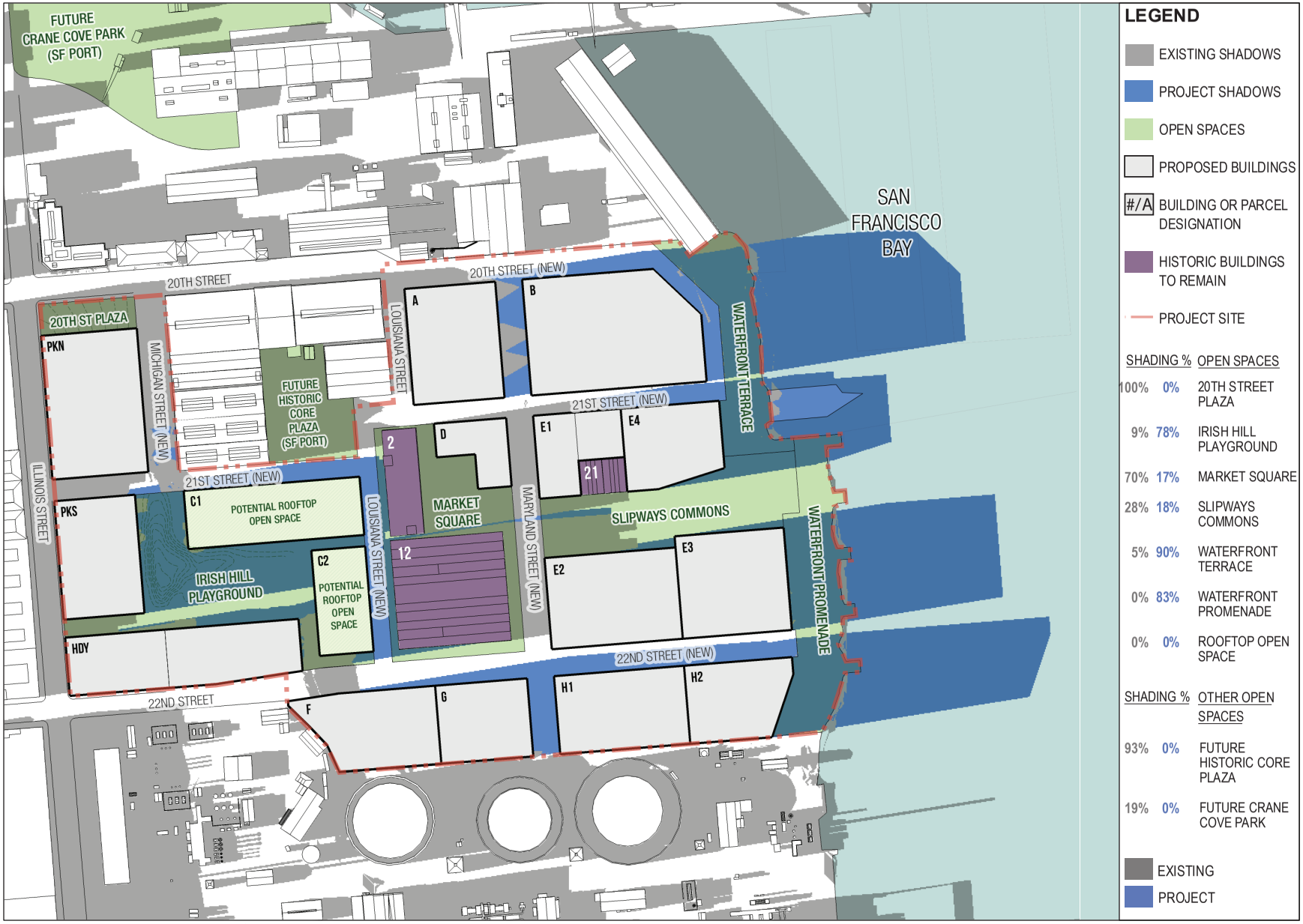
FIGURE 4.I.15: PROJECT SHADOW AT 12:00 PM 12:00 AM (PDT) ON THE EQUINOXES



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

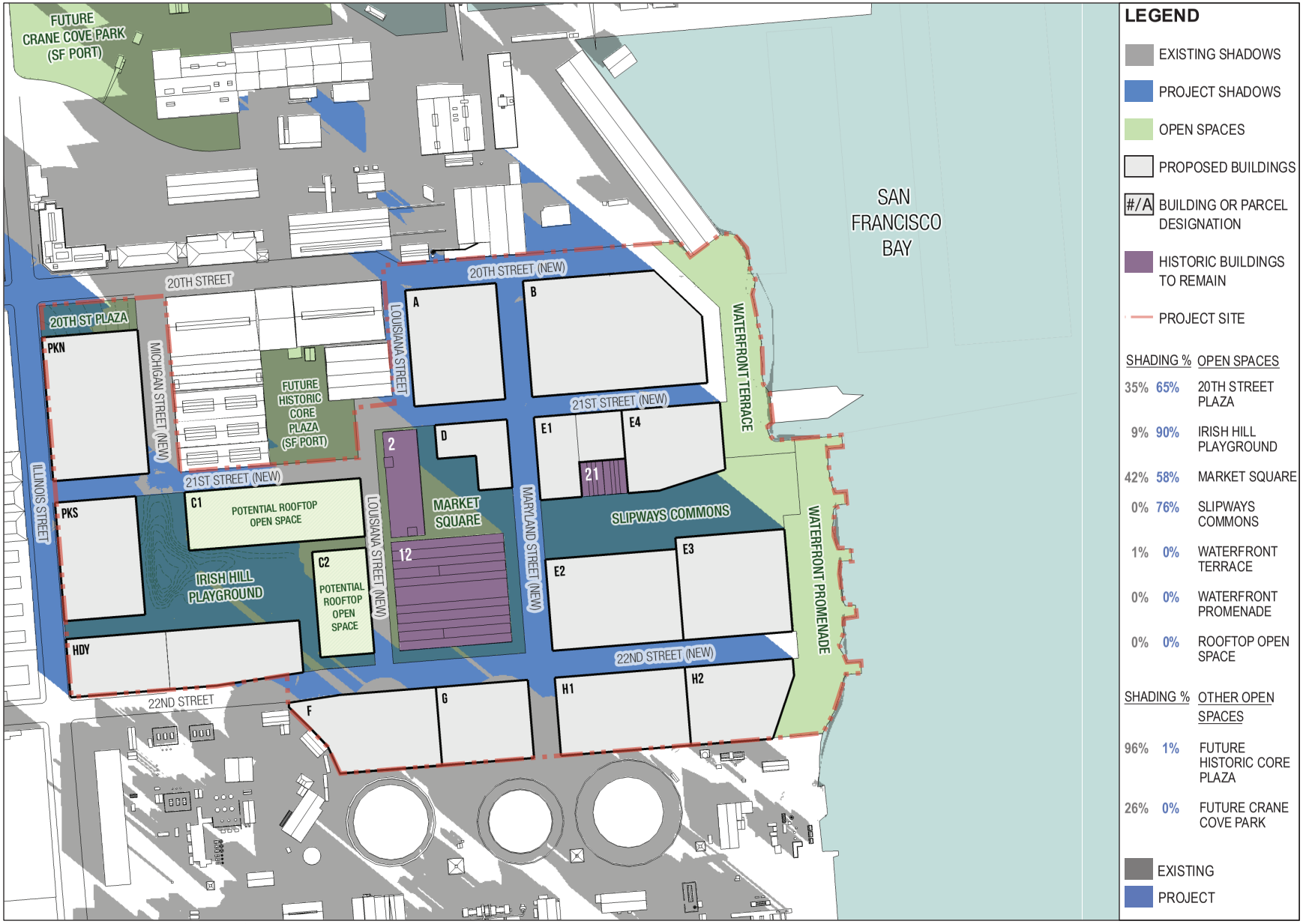
FIGURE 4.1.16: PROJECT SHADOW AT 3:00 PM (PDT) ON THE EQUINOXES



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.17: PROJECT SHADOW AT 5:06 PM (PDT) ON THE EQUINOXES



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

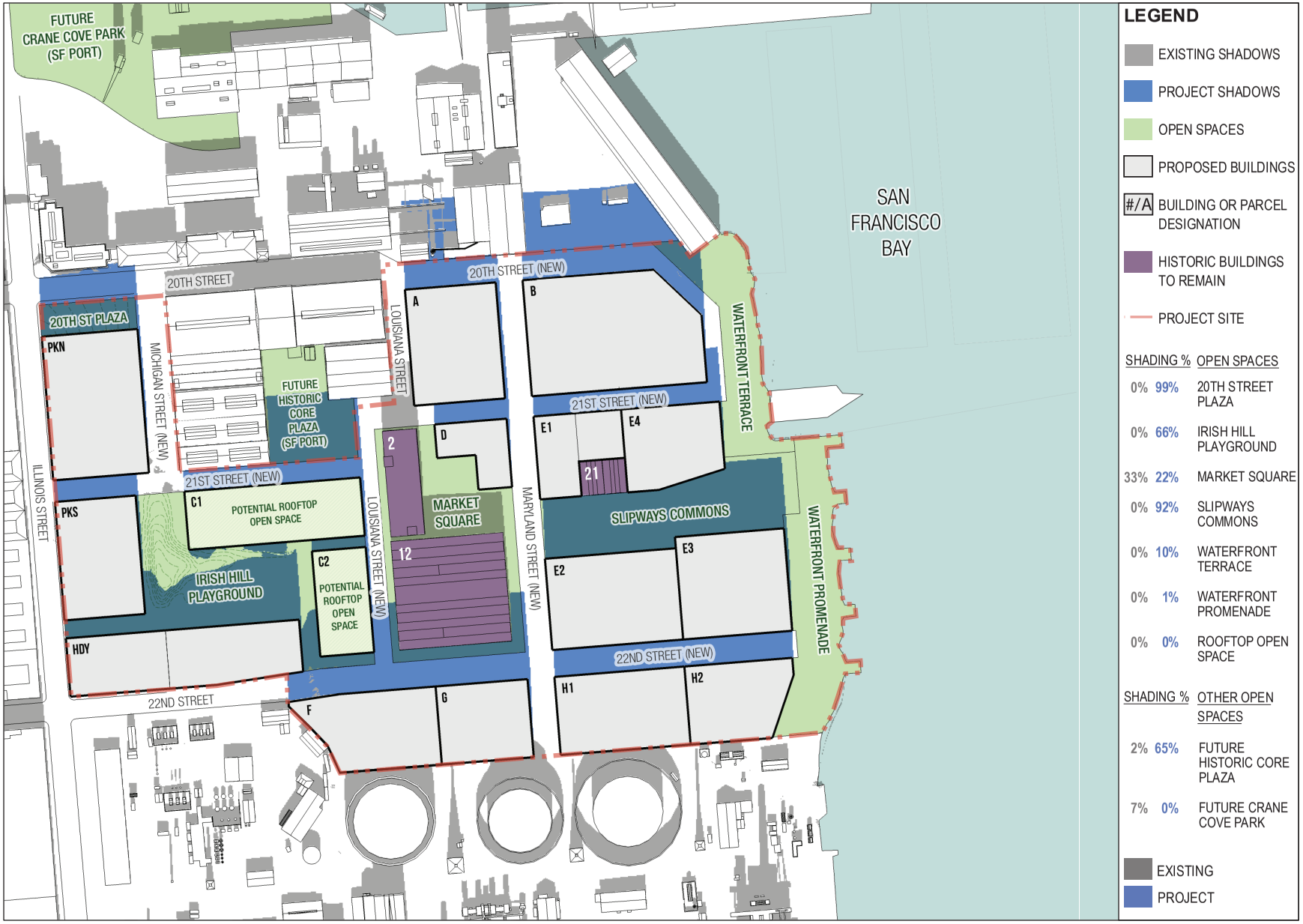
FIGURE 4.1.18: PROJECT SHADOW AT 8:22 AM (PST) ON THE WINTER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.19: PROJECT SHADOW AT 10:00 AM (PST) ON THE WINTER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

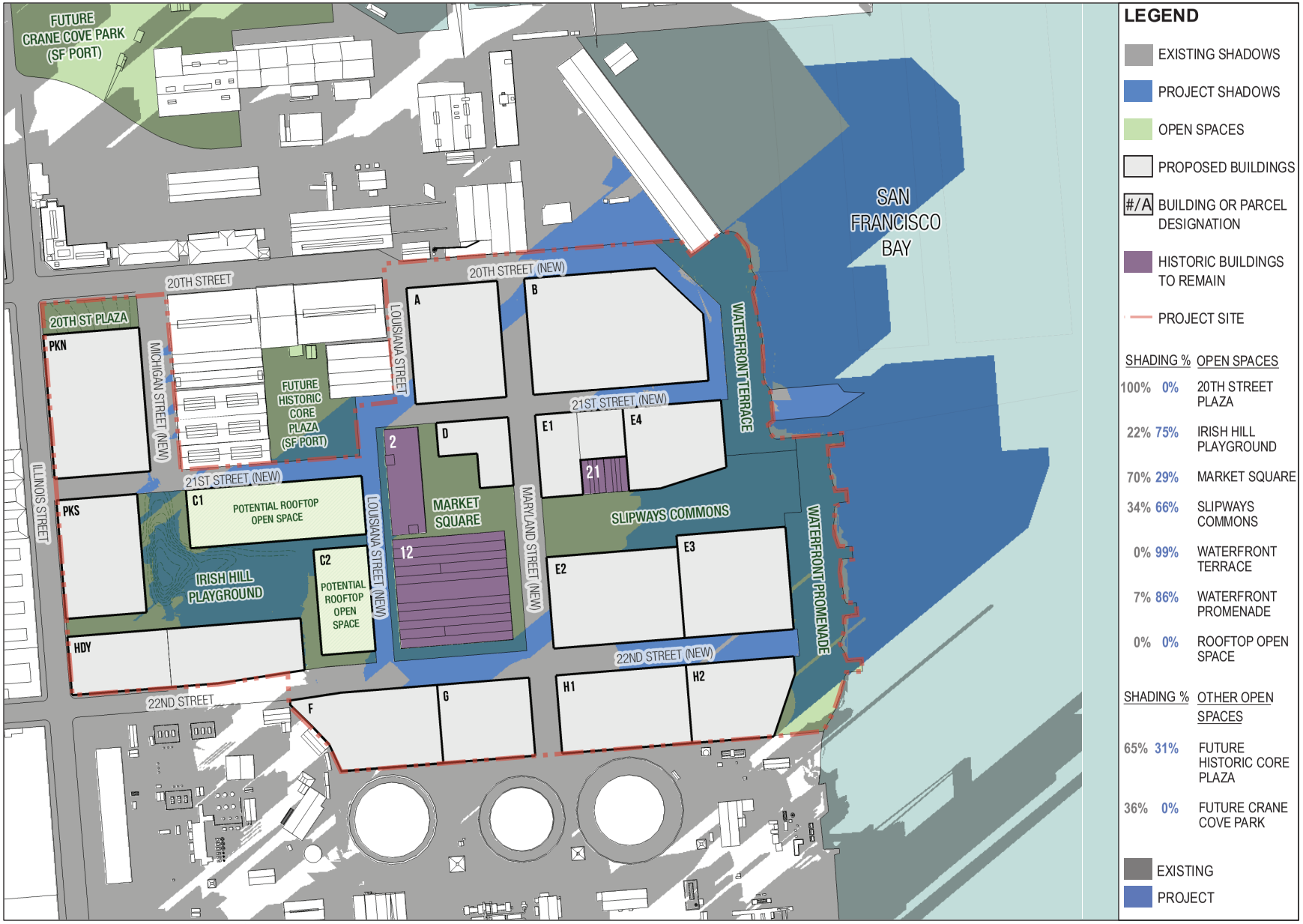
FIGURE 4.1.20: PROJECT SHADOW AT 12:00 PM (PST) ON THE WINTER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.I.21: PROJECT SHADOW AT 3:00 PM (PST) ON THE WINTER SOLSTICE



Source: Prevision Design, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.1.22: PROJECT SHADOW AT 3:55 PM (PST) ON THE WINTER SOLSTICE

Future Historic Core Plaza

On the summer solstice, new shadow created by new buildings under the Proposed Project (new project shadow) would not reach the Historic Core Plaza open space that is part of baseline conditions during the representative times of midday peak usage (10:00 a.m., 12:00 p.m., and 3:00 p.m.). This open space would receive some shadow from adjacent existing buildings at these times, shading up to 17 percent of the space at 10:00 a.m. On the equinoxes at 10:00 a.m., 12:00 p.m., and 3:00 p.m., new buildings within Parcel C1 would create new project shadow on the open space along its southern end, shading up to 16 percent of the open space at 12:00 p.m. This open space would receive some shadow from adjacent existing buildings at these times, shading up to 34 percent of the space at 3:00 p.m.

On the winter solstice at 10:00 a.m., 12:00 p.m., and 3:00 p.m., new buildings within Parcel C1 would create new project shadow on the open space along its southern end, shading up to 65 percent of the open space at 12:00 p.m. This open space would receive some shadow from adjacent existing buildings at these times, shading up to 43 percent of the space at 3:00 p.m.

Table 4.I.3: Shadow Coverage (Percent) on Historic Core Plaza with the Proposed Project presents and summarizes the percentage of the open space area covered by (1) shadow from existing buildings in the vicinity of the project site and from rehabilitated buildings that would be retained under the Proposed Project; (2) new shadow created by new buildings under the Proposed Project; and (3) remaining sunlight on the open space. The representative times are shown on an hourly basis, beginning one hour after sunrise and ending one hour before sunset, on the summer solstice, equinoxes, and winter solstice.

Maximum project shadow would occur around noon around the winter solstice, when new buildings in Parcel C1 would shade up to 66 percent of the open space. Future Historic Core Plaza would remain mostly sunny for most of the year during the times of midday peak usage. Around the winter solstice, most of the plaza would be shaded during most of the times of peak midday usage. The Historic Core Plaza is an urban plaza that is defined by the existing and proposed buildings that enclose it and relies on the immediate proximity of these buildings, and food service and commercial uses to be housed therein, to activate the space. Activities within the plaza could include sitting, dining, outdoor markets, and performances. Under conditions when the Historic Core Plaza would be shadowed, persons seeking sunlight would have ready access to the nearby Waterfront Promenade and Waterfront Terrace open spaces, which would be entirely sunny to mostly sunny during the morning through at least early afternoon throughout the year, and through late afternoon around the summer solstice. Therefore, the Proposed Project would not substantially affect the use of the future Historic Core Plaza. The Proposed Project

Table 4.I.3: Shadow Coverage (Percent) on Historic Core Plaza with the Proposed Project

Time[1]	Summer Solstice (June 21)				Equinoxes (March 20 and September 22)				Winter Solstice (December 21)			
	Study Start / End[2]	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*
6:00 a.m.	6:48	69	28	3	6:58	80	17	3		–	–	
7:00 a.m.		66	31	3		80	17	3		–	–	
8:00 a.m.		52	11	37		59	5	36	8:22	96	1	3
9:00 a.m.		29	1	70		26	11	63		62	24	14
10:00 a.m.		17	0	83		9	14	77		18	55	27
11:00 a.m.		9	0	91		4	16	80		4	62	34
12:00 p.m.		5	0	95		1	16	83		2	65	33
1:00 p.m.		0	0	100		10	15	75		14	59	27
2:00 p.m.		6	0	94		20	13	67		30	53	17
3:00 p.m.		13	0	87		34	11	55		52	43	5
4:00 p.m.		22	0	78		57	7	36	3:55	65	31	4
5:00 p.m.		33	0	67		92	0	8		–	–	
6:00 p.m.		51	0	49	5:06	93	0	7		–	–	
7:00 p.m.		79	0	21		–	–			–	–	
8:00 p.m.	7:35	97	0	3		–	–			–	–	

Notes:

[1] The summer solstice and equinox times are Pacific Daylight Time (PDT). The winter solstice times are Pacific Standard Time (PST).

[2] The shading analysis starts one hour after sunrise and ends one hour before sunset per Planning Code Section 148.

[3] The existing shadow coverage includes shadow cast by existing buildings in the vicinity of the project site. It includes existing buildings on the project site that would be rehabilitated and retained under the Proposed Project. It does not include buildings that would be demolished.

Source: PreVision, 2015; Turnstone/SWCA.

would result in a less-than-significant shadow impact on the future Historic Core Plaza, and no mitigation measures are necessary.

Future Crane Cove Park

New project shadow would not reach the future Crane Cove park open space during any of the representative times of midday peak usage at any time of year. New buildings in Parcel A would shade an area comprising up to 0.25 percent of the park for about 15 minutes around 8:28 a.m. on and around the winter solstice. The shaded area of the park would be located along the southern side of Building 109. The new shadow occurs in the southernmost end of the park, which is otherwise shaded by existing buildings located north of 20th Street at this time. Therefore, the Proposed Project would not substantially affect the use of the future Crane Cove Park. The Proposed Project would result in a less-than-significant shadow impact on the future Crane Cove Park, and no mitigation measures are necessary.

Sidewalks in the Vicinity of the Project Site

The following discussion describes the shadow impacts of the Proposed Project on public sidewalks in the project vicinity on four representative days of the year: the summer solstice, the equinoxes, and the winter solstice.

Summer Solstice

New buildings within the project site would shade a segment of Illinois Street spanning from just south of 20th Street to just south of 22nd Street, and a segment of 22nd Street from just west of Third Street and the existing stub of 22nd Street east of Illinois Street, beginning around 6:48 a.m. Shadows would begin to recede from the west side of Illinois Street around 10:00 a.m. and would move completely off of the street by around 12:00 p.m. Shadows would begin to recede from the south side of 22nd street around 7:30 a.m. and would move completely off of the street by around 9:00 a.m. Although the potential reach of project shadow extends to the east side of Third Street (one block to the west of the project site), Third Street would already be shaded by the four-story American Industrial Center buildings across Illinois Street to the west and southwest of the project site.

The Equinoxes

New buildings within the project site would shade a segment of Illinois Street between 20th Street to the north and 22nd Street to the south, beginning around 6:58 a.m. Shadows would begin to recede from the west side of Illinois Street around 9:30 a.m. and would move completely off of the street by around 12:00 p.m. Although the potential reach of project shadow extends to the east side of Third Street (one block to the west of the project site), Third Street is already shaded

by the four-story American Industrial Center buildings across Illinois Street to the west and southwest of the project site under existing conditions.

Winter Solstice

New buildings within the project site would shade a segment of Illinois Street spanning from just north of 19th Street to just north of 22nd Street, and would also shade a segment of 20th Street spanning from just west of Illinois Street to Michigan Street. Shadows would begin to recede from the west side of Illinois Street, beginning around 10:00 a.m. and would move completely off of the street by around 12:00 p.m. Project shadow on 20th Street would remain until around 3:00 p.m. when the segment of 20th Street would be completely shaded by the existing American Industrial Center on the west side of Illinois Street. Although the potential reach of project shadow extends to the east side of Third Street (one block to the west of the project site) in the early morning hours, at this time, Third Street would already be shaded by existing buildings north of 20th Street and west of Illinois Street.

Conclusion

The Proposed Project would cast new shadow on nearby sidewalks, including, but not limited to, those on Illinois Street, 20th Street, and 22nd Street, at certain times of day throughout the year. Many of the sidewalks in the project vicinity are already shadowed for portions of the day by existing buildings, and new project shadow would be transitory in nature and would not substantially affect the use of the sidewalks. Overall, the Proposed Project would not increase the amount of shadow on the sidewalks above levels that are common and generally expected in densely developed urban environments.

Shadow from the Proposed Project would not substantially affect the use of sidewalks within the vicinity of the project site. Thus, the impact of the project shadow on public areas would be less than significant, and no mitigation measures are necessary.

San Francisco Bay

New buildings within the project site would shade the surface of San Francisco Bay immediately east of the project site late in the day throughout the year. During the summer solstice, project shadow would reach San Francisco Bay at around 5:00 p.m. and would grow in length, extending southeastward into San Francisco Bay by as much as 460 feet until 7:35 p.m., one hour before sunset. During the equinoxes, project shadow would reach San Francisco Bay at around 3:00 p.m. and would grow in length, extending eastward into San Francisco Bay by as much as 525 feet until 5:06 p.m., one hour before sunset. During the winter solstice, project shadow would reach San Francisco Bay at around 1:45 p.m. and would grow in length, extending

northeastward into the Bay by as much as 525 feet until 3:55 p.m., one hour before sunset. Project shadow on San Francisco Bay would not substantially affect the use of San Francisco Bay for recreational users. Recreational users of San Francisco Bay who seek sunlight could readily relocate beyond the reach of project shadow. The Proposed Project would result in a less-than-significant shadow impact on San Francisco Bay, and no mitigation measures are necessary.

On-Site Open Space Included as Part of the Proposed Project (Informational Discussion)

This Impacts discussion about shadow that would be cast by the Proposed Project on public open space to be constructed within the project site as part of the Proposed Project is provided for informational purposes only. Implementation of the Proposed Project would result in the creation of publicly accessible open spaces within the project site. New buildings within the project site associated with the Proposed Project would also cast shadow on those proposed new open spaces within the project site. Those existing areas are not proposed to be placed under the jurisdiction of, or designated to be acquired by, the Recreation and Park Commission, and further, are not subject to Section 295 of the Planning Code. As these areas are not currently developed or accessible as public open space, shadow on these spaces would not interfere with any existing recreational uses.

The Proposed Project would include 9 acres of publicly owned open space. (See Figure 2.15: Proposed Open Space Plan, in Chapter 2, Project Description, p. 2.46.) Open spaces that are part of the Proposed Project would include the Waterfront Promenade, Waterfront Terrace, Slipways Commons, Building 12 Market Plaza and Market Square, Irish Hill Playground, and 20th Street Plaza. If constructed as structured parking, the rooftops of structures on Parcels C1 and C2 would provide public open space in addition to the 9 acres.

New buildings that would be constructed under the Proposed Project would shadow each of the Proposed Project's planned open spaces. The general sunlight and shadow conditions at each open space proposed for the project site are summarized in this section. In the following summaries, shadow or sunlight coverage descriptions are generalized and the times given are approximations.

Proposed Waterfront Terrace

On the summer solstice, at 10:00 a.m. and 12:00 p.m., the Proposed Project would not create any new shadow on the Waterfront Terrace open space. At 3:00 p.m., new buildings within Parcels B2 and E4 would create new project shadow on this open space along its western boundary, shading up to 14 percent of the open space.

On the equinoxes, at 10:00 a.m., the Proposed Project would not create any new project shadow on this open space. At 12:00 p.m., new buildings within Parcel B2 would create new project shadow at the northern end of the open space along its western boundary, shading up to 5 percent of the open space. At 3:00 p.m., new buildings within Parcels B2 and E4 would shade about 80 percent of the open space.

On the winter solstice, at 10:00 a.m., the Proposed Project would cast net new shadow on the southwestern corner of this open space. At 12:00 p.m., new buildings within Parcel B2 would create new project shadow at the northern end of the open space along its western boundary, shading up to 10 percent of the open space. At 3:00 p.m., new buildings within Parcels B2 and E4 would shade about 96 percent of the open space.

See Table 4.I.4: Shadow Coverage (Percent) on the Waterfront Terrace with the Proposed Project.

The Waterfront Terrace is envisioned as a waterfront open space with landside restaurants and expansive views of San Francisco Bay. The space would be entirely sunny, or mostly sunny, during the morning and through at least early afternoon throughout the year, and would be mostly sunny through late afternoon around the summer solstice. When shaded by new buildings (beginning in the mid-afternoon around the summer solstice, midday around the equinoxes, and late morning around the winter solstice, and lasting for the remainder of the daylight hours), the waterfront open space would be less usable for those seeking sunlight but would continue to offer waterfront access and San Francisco Bay views.

Proposed Waterfront Promenade

On the summer solstice, at 10:00 a.m. and 12:00 p.m., the Proposed Project would not create any new project shadow on the Waterfront Promenade open space. At 3:00 p.m., new buildings within Parcels E3 and H2 would create new project shadow on this open space along its western boundary, shading up to 25 percent of the open space.

On the equinoxes, at 10:00 a.m., the Proposed Project would not create any new project shadow on this open space. At 12:00 p.m., new buildings within Parcel E3 would create new project shadow along its western boundary bordering Parcel E3, shading up to 1 percent of the open space. At 3:00 p.m., new buildings within Parcels E3 and H2 would shade about 71 percent of the open space.

Table 4.I.4. Shadow Coverage (Percent) on the Waterfront Terrace with the Proposed Project

Time[1]	Summer Solstice (June 21)				Equinoxes (March 20 and September 22)				Winter Solstice (December 21)			
	Study Start / End[2]	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*
6:00 a.m.	6:48	4	0	100	6:58	3	0	97		–	–	
7:00 a.m.		0	0	100		3	0	97		–	–	
8:00 a.m.		0	0	100		2	0	98	8:22	1	0	99
9:00 a.m.		0	0	100		1	0	99		0	0	100
10:00 a.m.		1	0	100		0	0	100		0	1	99
11:00 a.m.		0	0	100		0	0	100		0	5	95
12:00 p.m.		0	0	100		0	5	95		0	10	90
1:00 p.m.		0	0	100		0	20	80		0	36	64
2:00 p.m.		0	2	98		0	46	54		0	63	37
3:00 p.m.		1	14	85		0	80	20		0	96	4
4:00 p.m.		2	34	64		3	91	6	3:55	0	99	1
5:00 p.m.		5	56	39		5	91	4		–	–	
6:00 p.m.		6	68	26	5:06	5	90	5		–	–	
7:00 p.m.		11	66	23		–	–	–		–	–	
8:00 p.m.	7:35	13	62	25		–	–	–		–	–	

Notes:

[1] The summer solstice and equinox times are Pacific Daylight Time (PDT). The winter solstice times are Pacific Standard Time (PST).

[2] The shading analysis starts one hour after sunrise and ends one hour before sunset per Planning Code Section 148.

[3] The existing shadow coverage includes shadow cast by existing buildings in the vicinity of the project site. It includes existing buildings on the project site that would be rehabilitated and retained under the Proposed Project. It does not include buildings that would be demolished.

Source: PreVision, 2015; Turnstone/SWCA.

On the winter solstice, at 10:00 a.m., the Proposed Project would not create any new project shadow on this open space. At 12:00 p.m., new buildings within Parcel E3 would create new project shadow along its western boundary bordering Parcel E3, shading up to 1 percent of the open space. At 3:00 p.m., new buildings within Parcels E3 and H2 would shade about 83 percent of the open space.

See Table 4.I.5: Shadow Coverage (Percent) on the Waterfront Promenade with the Proposed Project.

The Waterfront Promenade is envisioned as a waterfront open space with landside restaurants and expansive views of San Francisco Bay. The space would be entirely sunny, or mostly sunny, during the morning and through early afternoon throughout the year, and would be mostly sunny through late afternoon around the summer solstice. When shaded by new buildings (beginning in the mid-afternoon around the summer solstice, midday around the equinoxes, and late morning around the winter solstice, and lasting for the remainder of the daylight hours during those days), the waterfront open space would be less usable for those seeking sunlight but would continue to offer waterfront access and San Francisco Bay views.

Proposed Slipways Commons

On the summer solstice, at 10:00 a.m., 12:00 p.m., and 3:00 p.m., new buildings in Parcels E2 and E3 would create new project shadow along the southern end of the Slipways Commons open space, shading up to 15 percent of the open space along its southern edge at 12:00 p.m.

On the equinoxes, at 10:00 a.m., 12:00 p.m., and 3:00 p.m., new buildings in Parcels E2 and E3 would create new project shadow within the southern portion of this open space, shading up to 46 percent of the open space at 10:00 a.m.

On the winter solstice, at 10:00 a.m., 12:00 p.m., and 3:00 p.m., new buildings in Parcels E2 and E3 would create new project shadow within most of this open space, shading up to 92 percent of the open space at 12:00 p.m.

See Table 4.I.6: Shadow Coverage (Percent) on Slipways Commons with the Proposed Project.

Slipways Commons is envisioned as a gathering place and would be programmed with community and cultural events. The space would be an urban plaza that is defined by the existing and proposed buildings that would enclose it and would rely on the proximity of these buildings,

Table 4.I.5. Shadow Coverage (Percent) on the Waterfront Promenade with the Proposed Project

Time[1]	Summer Solstice (June 21)				Equinoxes (March 20 and September 22)				Winter Solstice (December 21)			
	Study Start / End[2]	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*
6:00 a.m.	6:48	0	0	100	6:58	0	0	100		–	–	
7:00 a.m.		0	0	100		0	0	100		–	–	
8:00 a.m.		0	0	100		0	0	100	8:22	0	0	100
9:00 a.m.		0	0	100		0	0	100		0	0	100
10:00 a.m.		0	0	100		0	0	100		0	0	100
11:00 a.m.		0	0	100		0	0	100		0	0	100
12:00 p.m.		0	0	100		0	1	99		0	1	99
1:00 p.m.		0	0	100		0	14	86		0	20	80
2:00 p.m.		0	9	91		0	39	61		0	63	37
3:00 p.m.		0	25	75		0	71	29		1	83	16
4:00 p.m.		0	42	58		0	79	21	3:55	7	86	7
5:00 p.m.		0	64	36		0	84	16		–	–	
6:00 p.m.		0	68	32	5:06	0	83	17		–	–	
7:00 p.m.		0	87	13		–	–			–	–	
8:00 p.m.	7:35	0	100	0		–	–			–	–	

Notes:

1 The summer solstice and equinox times are Pacific Daylight Time (PDT). The winter solstice times are Pacific Standard Time (PST).

2 The shading analysis starts one hour after sunrise and ends one hour before sunset per Planning Code Section 148.

3 The existing shadow coverage includes shadow cast by existing buildings in the vicinity of the project site. It includes existing buildings on the project site that would be rehabilitated and retained under the Proposed Project. It does not include buildings that would be demolished.

Source: PreVision, 2015; Turnstone/SWCA.

Table 4.I.6. Shadow Coverage (Percent) on Slipways Commons with the Proposed Project

Time[1]	Summer Solstice (June 21)				Equinoxes (March 20 and September 22)				Winter Solstice (December 21)			
	Study Start / End[2]	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*
6:00 a.m.	6:48	0	21	79	6:58	0	47	53		–	–	
7:00 a.m.		0	17	83		0	48	52		–	–	
8:00 a.m.		0	7	93		0	50	50	8:22	0	76	24
9:00 a.m.		0	4	96		0	48	52		0	79	21
10:00 a.m.		0	11	89		0	46	54		0	84	16
11:00 a.m.		0	14	86		0	45	55		0	89	11
12:00 p.m.		0	15	85		0	44	56		0	92	8
1:00 p.m.		0	15	85		0	42	58		0	94	6
2:00 p.m.		0	13	87		0	39	61		0	93	7
3:00 p.m.		0	10	90		0	34	66		7	88	12
4:00 p.m.		0	7	93		4	27	69	3:55	34	66	0
5:00 p.m.		0	10	90		23	19	58		–	–	
6:00 p.m.		1	30	69	5:06	28	18	54		–	–	
7:00 p.m.		2	76	22		–	–			–	–	
8:00 p.m.	7:35	27	73	0		–	–			–	–	

Notes:

[1] The summer solstice and equinox times are Pacific Daylight Time (PDT). The winter solstice times are Pacific Standard Time (PST).

[2] The shading analysis starts one hour after sunrise and ends one hour before sunset per Planning Code Section 148.

[3] The existing shadow coverage includes shadow cast by existing buildings in the vicinity of the project site. It includes existing buildings on the project site that would be rehabilitated and retained under the Proposed Project. It does not include buildings that would be demolished.

Source: PreVision, 2015; Turnstone/SWCA.

and services and uses housed therein, to activate it. The space would remain mostly sunny for most of the year during the times of midday peak usage. Around the winter solstice, most of the open space would be shaded during the times of peak midday usage. Persons seeking sunlight would have seating options at the northern portion of the space that would remain in sunlight through late afternoon for most of the year, as well as adjacent Waterfront Promenade and Waterfront Terrace open spaces, which would be entirely sunny, or mostly sunny, during the morning through at least early afternoon throughout the year, and through late afternoon around the summer solstice. When shaded by new buildings, the waterfront open space would be less usable for those seeking sunlight but would continue to offer framed views of San Francisco Bay.

Proposed Building 12 Market and Market Square

On the summer solstice, at 10:00 a.m., new buildings in Parcel D would create new project shadow in the northern portion of Market Square, and new buildings in Parcels E1 and E2 would create new project shadow along the western side of the proposed Maryland Street, together shading up to 25 percent of the open space. At that time, rehabilitated Buildings 2 and 12 would shade 18 percent of Market Square along the eastern side of the proposed Louisiana Street. At 12:00 p.m., new buildings in Parcel D would create new project shadow in the northern portion of Market Square, shading up to 7 percent of the open space. At that time, rehabilitated Buildings 2 and 12 would shade 19 percent of Market Square along the eastern side of the proposed Louisiana Street. At 3:00 p.m., new buildings in Parcels C1 and C2 would create new project shadow along the eastern side of the proposed Louisiana Street, shading up to 8 percent of the open space. At that time, rehabilitated Buildings 2 and 12 would shade 31 percent of the open space within Market Square and along the western side of the proposed Maryland Street.

On the equinoxes, at 10:00 a.m., new buildings in Parcel D would create new project shadow in the northern portion of Market Square and new buildings in Parcels F, G, and H1 would create new project shadow along the northern side of 22nd Street, together totaling 19 percent of Market Square. At that time, rehabilitated Buildings 2 and 12 would shade 28 percent of Market Square including the eastern side of the proposed Louisiana Street. At 12:00 p.m., new buildings in Parcels F and G would create new project shadow along the northern side of 22nd Street, shading up to 11 percent of the open space. At that time, rehabilitated Building 12 would shade 16 percent of Market Square north of Building 12. At 3:00 p.m., new buildings in Parcels F and G would create new project shadow along the northern side of 22nd Street, and new buildings in Parcels C1 and C2 would create new project shadow along the eastern side of Louisiana Street, together shading up to 19 percent of the open space. At that time, rehabilitated Buildings 2 and 12 would shade 55 percent of Market Square east of those buildings.

On the winter solstice, at 10:00 a.m., new buildings in Parcel D would create new project shadow in the northern portion of Market Square, and new buildings within Parcels E2, F, G, and H1would create new project shadow along the northern side of 22nd Street and the western side of Maryland Street, together totaling 38 percent of Market Square. At that time, rehabilitated Buildings 2 and 12 would shade 44 percent of Market Square including the eastern side of the proposed Louisiana Street. At 12:00 p.m., new buildings in Parcels F and G would create new project shadow along the northern side of 22nd Street, the eastern side of Louisiana Street, and the western side of Maryland Street, shading up to 22 percent of the open space. At that time, rehabilitated Building 12 would shade about 33 percent of Market Square north of the building. At 3:00 p.m., new buildings in Parcels C1 and C2 would create new project shadow along the eastern side of Louisiana Street, and new buildings in Parcels F and G would create new project shadow along the northern side of 22nd Street, together shading up to 29 percent of the open space. At that time, rehabilitated Buildings 2 and 12 would shade 70 percent of Market Square east of the buildings.

See Table 4.I.7: Shadow Coverage (Percent) on Market Square and Building 12 Plaza with the Proposed Project.

Market Square is envisioned as an urban plaza and marketplace with ground floor uses of surrounding buildings extending outside. As such, it would be defined by the existing and proposed buildings that enclose it and would rely on the immediate proximity of these buildings, and services and uses housed therein, to activate the space. The space would remain mostly sunny around the summer solstice during the times of midday peak usage. Around the equinoxes, it would remain mostly sunny until rehabilitated Buildings 2 and12 would shade most of the area in the mid-afternoon. Around the winter solstice, the space would be mostly shaded during times of midday peak usage. Persons seeking sunlight would have access to the adjacent Slipways Commons and the nearby Waterfront Promenade and Waterfront Terrace open spaces.

Proposed Irish Hill Playground

On the summer solstice, at 10:00 a.m., new buildings in Parcels C1, C2, and HDY would create new project shadow west of Parcels C1 and C2, and north of Parcel HDY, together shading up to 25 percent of the Irish Hill Playground open space. At 12:00 p.m., new buildings in Parcels C1, C2, and HDY would create new project shadow west of Parcel C1, north and west of Parcel C2, and north of Parcel HDY, together shading up to 23 percent of the open space. At 3:00 p.m., new buildings in Parcels C1, C2, and HDY would create new project shadow east of Parcel C1, north of Parcel C2, and north and east of Parcel HDY, together shading up to 23 percent of the open space.

Table 4.I.7. Shadow Coverage (Percent) on Market Square and Building 12 Plaza with the Proposed Project

Time[1]	Summer Solstice (June 21)				Equinoxes (March 20 and September 22)				Winter Solstice (December 21)			
	Study Start / End[2]	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*
6:00 a.m.	6:48	26	71	3	6:58	22	54	24		–	–	
7:00 a.m.		26	70	4		22	53	25		–	–	
8:00 a.m.		21	56	23		26	43	31	8:22	42	58	0
9:00 a.m.		14	40	46		27	36	37		45	50	5
10:00 a.m.		18	25	57		28	19	53		44	38	18
11:00 a.m.		20	12	68		27	15	58		43	17	40
12:00 p.m.		19	7	74		16	11	73		33	22	45
1:00 p.m.		7	1	92		33	10	57		55	29	16
2:00 p.m.		17	0	83		45	21	34		64	30	6
3:00 p.m.		31	8	61		55	19	26		70	29	1
4:00 p.m.		37	11	52		65	16	19	3:55	70	29	1
5:00 p.m.		49	13	38		70	15	15		–	–	
6:00 p.m.		69	16	15	5:06	70	17	13		–	–	
7:00 p.m.		80	14	6		–	–			–	–	
8:00 p.m.	7:35	87	11	2		–	–			–	–	

Notes:

1 The summer solstice and equinox times are Pacific Daylight Time (PDT). The winter solstice times are Pacific Standard Time (PST).

2 The shading analysis starts one hour after sunrise and ends one hour before sunset per Planning Code Section 148.

3 The existing shadow coverage includes shadow cast by existing buildings in the vicinity of the project site. It includes existing buildings on the project site that would be rehabilitated and retained under the Proposed Project. It does not include buildings that would be demolished.

Source: PreVision, 2015; Turnstone/SWCA.

On the equinoxes, at 10:00 a.m., new buildings in Parcels C1, C2, F, and HDY would create new project shadow west of Parcel C1, north and west of Parcel C2, north of Parcel HDY, and along the northern side of 22nd Street within the open space, together shading up to 51 percent of the open space. At 12:00 p.m., new buildings in Parcels C2, F, and HDY would create new project shadow north of Parcels C2 and HDY, and along the northern side of 22nd Street within the open space, together shading up to 35 percent of the open space. At 3:00 p.m., new buildings in Parcels C2, HDY, F, and PKS would create new project shadow east of Parcel PKS, north of Parcel C2, north and east of Parcel HDY, and along the northern side of 22nd Street within the open space, together shading up to 56 percent of the open space.

On the winter solstice, at 10:00 a.m., new buildings in Parcels C1, C2, F, and HDY would create new project shadow throughout most of the open space, together shading up to 83 percent of the open space. At 12:00 p.m., new buildings in Parcels C2, F, and HDY would create new project shadow north of Parcels C2 and HDY, and along the northern side of 22nd Street and at the southern entrance to the open space, together shading up to 66 percent of the open space. At 3:00 p.m., new buildings in Parcels C2, F, HDY, and PKS would create new project shadow throughout most of the open space, together shading up to 94 percent of the open space. At that time, the existing building along the western side of Illinois Street would shade 2 percent of the open space at its western entrance.

See Table 4.I.8: Shadow Coverage (Percent) on Irish Hill Playground with the Proposed Project.

Irish Hill Playground is envisioned as a children's playground within an urban public plaza for residents of the Proposed Project and surrounding neighborhood. The space would include play structures and seating in the southeastern portion of the space, and the remnant of Irish Hill in the northwestern portion of the space.

The space would remain mostly sunny around the summer solstice in the midday. As a playground, the space may receive its highest volume of use outside of the representative times of peak midday use, for example, after school in the late afternoon. Around the equinoxes, much of the playground area would be shaded by new buildings in the midday. Around the winter solstice, the new buildings surrounding the playground area would shade most of the space in the midday. Shadow from buildings that would enclose the space to the west, south, and east under the Proposed Project would decrease the comfort of the space for use as a playground for much of the day throughout the year for those users who prefer sunlight to shade.

Table 4.I.8. Shadow Coverage (Percent) on Irish Hill Playground with the Proposed Project

Time[1]	Summer Solstice (June 21)				Equinoxes (March 20 and September 22)				Winter Solstice (December 21)			
	Study Start / End[2]	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*
6:00 a.m.	6:48	29	67	4	6:58	9	82	9		–	–	
7:00 a.m.		19	70	11		9	81	10		–	–	
8:00 a.m.		4	55	41		1	73	26	8:22	9	90	1
9:00 a.m.		1	35	64		0	63	37		2	91	7
10:00 a.m.		0	31	69		0	51	49		0	83	17
11:00 a.m.		0	28	72		0	43	57		0	73	27
12:00 p.m.		0	23	77		0	35	65		0	66	34
1:00 p.m.		0	15	85		0	44	56		0	76	24
2:00 p.m.		0	19	81		0	47	53		0	91	9
3:00 p.m.		0	23	77		0	56	44		2	94	4
4:00 p.m.		0	22	78		2	63	35	3:55	22	75	3
5:00 p.m.		0	37	63		7	79	14		–	–	
6:00 p.m.		0	59	41	5:06	9	78	13		–	–	
7:00 p.m.		3	85	12		–	–			–	–	
8:00 p.m.	7:35	16	84	0		–	–			–	–	

Notes:

[1] The summer solstice and equinox times are Pacific Daylight Time (PDT). The winter solstice times are Pacific Standard Time (PST).

[2] The shading analysis starts one hour after sunrise and ends one hour before sunset per Planning Code Section 148.

[3] The existing shadow coverage includes shadow cast by existing buildings in the vicinity of the project site. It includes existing buildings on the project site that would be rehabilitated and retained under the Proposed Project. It does not include buildings that would be demolished.

Source: PreVision, 2015; Turnstone/SWCA.

Proposed 20th Street Plaza

On the summer solstice, new buildings in Parcel PKN would create new project shadow north of Parcel PKN, shading up to 13, 26, and 17 percent of the 20th Street Plaza open space at 10:00 a.m., 12:00 p.m., and 3:00 p.m., respectively.

On the equinoxes, new buildings in Parcel PKN would create new project shadow north of Parcel PKN, shading up to 77, 83, and 56 percent of the open space at 10:00 a.m., 12:00 p.m., and 3:00 p.m., respectively. At 3:00 p.m., the existing building along the western side of Illinois Street would shade 16 percent of the open space at its western end.

On the winter solstice, new buildings in Parcel PKN would create new project shadow north of Parcel PKN, shading up to 91, 99, and 36 percent of the open space, at 10:00 a.m., 12:00 p.m., and 3:00 p.m., respectively. At 3:00 p.m., the existing building along the western side of Illinois Street would shade 36 percent of the open space at its western end.

20th Street Plaza is envisioned as an urban plaza that would serve as the gateway to Pier 70, and allow views of historic Building 113. The space would remain mostly sunny around the summer solstice during the times of midday peak usage. Around the equinoxes and winter solstice, most of the space would be shaded by new buildings within Parcel PKN and by existing buildings along the western side of Illinois Street in the afternoon. Proposed shadow on this space would not interfere with the purpose of the space to provide a gateway to the Pier 70 complex and to provide a view of historic Building 113.

See Table 4.I.9: Shadow Coverage (Percent) on 20th Street Plaza with the Proposed Project.

Proposed Rooftop Open Space

If constructed at the maximum allowable height of 90 feet, rooftop open spaces in Parcels C1 and C2 would not be shaded by new buildings or existing buildings at any time during the day or year. Shadow could be cast on these open spaces by other buildings proposed on the project site if these parking structures were not built to the maximum allowable height.

Conclusion

In summary, the Proposed Project would cast shadow on open spaces in the vicinity of the project site, existing sidewalks in the vicinity of the project site, and San Francisco Bay. (The shadow that would be cast by the Proposed Project on open spaces to be developed as part of the Proposed Project is included above for informational purposes.)

Table 4.I.9. Shadow Coverage (Percent) on 20th Street Plaza with the Proposed Project

Time[1]	Summer Solstice (June 21)				Equinoxes (March 20 and September 22)				Winter Solstice (December 21)			
	Study Start / End[2]	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*	*Study Start / End*	*Shadow: Existing / Rehabilitated Buildings[3] (%)*	*Shadow: New Buildings (%)*	*Sun: Remaining (%)*
6:00 a.m.	6:48	21	0	79	6:58	59	25	16		–	–	
7:00 a.m.		15	0	85		56	27	17		–	–	
8:00 a.m.		6	0	94		14	59	27	8:22	35	65	0
9:00 a.m.		0	0	100		0	71	29		5	86	9
10:00 a.m.		0	13	87		0	77	23		0	91	9
11:00 a.m.		0	22	78		0	81	19		0	96	4
12:00 p.m.		0	26	74		0	83	17		0	99	1
1:00 p.m.		0	27	73		0	76	24		0	95	5
2:00 p.m.		0	24	76		0	68	32		14	85	1
3:00 p.m.		0	17	83		16	56	28		64	36	0
4:00 p.m.		0	7	93		55	28	17	3:55	100	0	0
5:00 p.m.		10	0	90		100	0	0		–	–	
6:00 p.m.		21	0	79	5:06	100	0	0		–	–	
7:00 p.m.		11	0	89		–	–			–	–	
8:00 p.m.	7:35	33	0	67		–	–			–	–	

Notes:

1 The summer solstice and equinox times are Pacific Daylight Time (PDT). The winter solstice times are Pacific Standard Time (PST).

2 The shading analysis starts one hour after sunrise and ends one hour before sunset per Planning Code Section 148.

3 The existing shadow coverage includes shadow cast by existing buildings in the vicinity of the project site. It includes existing buildings on the project site that would be rehabilitated and retained under the Proposed Project. It does not include buildings that would be demolished.

Source: PreVision, 2015; Turnstone/SWCA.

A project could have a significant impact if it were to create new shadow in a manner that substantially affects the use of outdoor recreation facilities or other public areas. As described above, the usability of parks, open spaces, and recreation areas in the vicinity of the project site would not be substantially adversely affected by shadow from the development of the Proposed Project. Thus, the shadow impacts of the Proposed Project would be less than significant. No mitigation measures are necessary.

Cumulative Impacts

Impact C-WS-2: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects in the project vicinity, would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas. The Proposed Project would not make a cumulatively considerable contribution to a significant cumulative shadow impact. ***(Less than Significant)***

As discussed in Section 4.A., Introduction to Chapter 4, pp. 4.A.12-4.A.17, there are two reasonably foreseeable cumulative projects in the immediate project vicinity that could potentially shade the same open spaces that would be shaded by the Proposed Project. Shadow from the foreseeable projects at 2051-2065 Third Street / 650 Illinois Street and at 2177 Third Street / 590 19th Street would not reach the future Historic Core Plaza, which is part of baseline conditions, nor any open spaces to be constructed under the Proposed Project due to the distance of these foreseeable projects and their respective positions north of the future Historic Core Plaza and Proposed Project open space.

The project at 2051-2065 Third Street / 650 Illinois Street includes construction of a new 6-story, 65-foot-tall building. The project at 2177 Third Street / 590 19th Street includes construction of two 7-story, 68-foot-tall buildings. These projects are located along the western side of Illinois Street directly across from the future Crane Cove Park and would shade the park beginning in the late afternoon around the summer solstice, mid-afternoon around the equinoxes, and early afternoon around the winter solstice. As discussed above, shadow from the Proposed Project would reach this open space early in the morning around the winter solstice and would briefly shade a 0.25 percent area of the park located along the southern side of Building 109 for approximately 12 minutes. As shadows from the Proposed Project would occur in the early morning hours around the winter solstice, they would not combine or contribute to afternoon shadows from these foreseeable projects, which would occur throughout the year. Although shadow from the Proposed Project, together with that of reasonably foreseeable projects, would combine to increase the overall amount of yearly shadow on the future Crane Cove Park, the Proposed Project would shade a small area of the park for a short duration in the early morning around the winter solstice, when park usage in San Francisco is typically low. The Proposed

Project would not make a cumulatively considerable contribution to cumulative shadow impacts on the future Crane Cove Park.

The Proposed Project would cast new shadow on sidewalks in the project vicinity at certain times of day throughout the year. Due to the dispersed locations of the reasonably foreseeable future projects, it is unlikely that they would combine with the Proposed Project to cast new shadow on the same sidewalk segments at the same time of day and/or the same time of year. The sidewalks in the project vicinity are already shadowed early and late in the day by multi-story buildings. Although implementation of the Proposed Project and the reasonably foreseeable future projects would add new shadow to the sidewalks in the project vicinity, these shadows would be transitory in nature, would not substantially affect the use of the sidewalks, and would not increase shadows above levels that are common and generally expected in an urban environment.

For these reasons, the Proposed Project, in combination with past, present, and reasonably foreseeable future projects in the project vicinity, would not have a significant cumulative shadow impact on outdoor recreation facilities and other public areas. The Proposed Project would not make a cumulatively considerable contribution to a significant cumulative shadow impact, and no mitigation measures are necessary.

J. RECREATION

Section 4.J, Recreation, analyzes the effects of the Proposed Project related to recreation resources. The Environmental Setting discussion describes existing Citywide and regional recreation resources and existing resources on and near the project site. The Impacts and Mitigation Measures analysis discusses the changes in demand for, and supply of, those resources that would occur with implementation of the Proposed Project. The section concludes with a discussion of the effects of the Proposed Project in combination with past, present, and reasonably foreseeable development.

Data used in this section include information obtained from the San Francisco Recreation and Parks Department (RPD), the Port of San Francisco (Port), the *San Francisco General Plan* (*General Plan*), and two components of the *General Plan*: the *Central Waterfront Area Plan* and the Recreation and Open Space Element (ROSE).

ENVIRONMENTAL SETTING

CITYWIDE AND REGIONAL RESOURCES

San Francisco has approximately 5,890 acres of open space in a variety of forms: parks, walkways, landscaped areas, recreational facilities, playing fields, and unmaintained open areas. This open space system is under the jurisdiction of several local, State, and Federal agencies as well as private owners, in the form of privately owned public open spaces (POPOS).[1] RPD owns and operates approximately 3,433 acres of permanently dedicated, public open space in San Francisco. The City's open space network also includes 560 acres of open space in the form of community gardens,[2] living streets,[3] POPOS, piers and wharves, university campuses, pilot program schoolyards, and parks or open spaces under the jurisdiction of the Port, the San Francisco Public Utilities Commission, the San Francisco Public Works, and the Office of

[1] POPOS in the City consist of publicly accessible spaces in the form of plazas, terraces, atriums, and small parks and landscaped areas (some with a few pedestrian amenities) that are provided and maintained by private developers. In San Francisco, POPOS mostly appear in the Downtown office district area.

[2] Most community gardens are managed by RPD's Community Gardens Program, which is part of a larger interagency Urban Agriculture Program that includes urban farms.

[3] Living streets (or living alleys) typically include special paving, traffic calming measures, lighting, seating, greening, and other elements to provide gathering space for pedestrians and to enhance the pedestrian experience.

Community Investment and Infrastructure, among others. San Francisco has approximately 1,642 acres of Federally owned park lands and 255 acres of State-owned park lands.[4]

RPD maintains more than 220 properties throughout the City, and its responsibilities include managing 1,100 acres of natural lands and trails; 25 large, full-complex recreation centers; 9 swimming pools; 6 golf courses; and hundreds of tennis courts, baseball diamonds, athletic fields, and basketball courts. RPD also manages many of the City's most famous locations, such as the Palace of Fine Arts, Golden Gate Park, Coit Tower, and the Marina Yacht Harbor. Several larger City-owned open spaces, including Golden Gate Park (about 1,000 acres), the Lake Merced Community Complex (about 600 acres), and John McLaren Park (about 300 acres), comprise approximately one-half of the total City-owned open space. These larger areas provide programs, activities, or recreational opportunities that serve the City as a whole, as do smaller areas with unique attributes such as water features or hilltop vista points. Federally owned park lands within San Francisco include those that are part of the Golden Gate National Recreation Area, the Presidio of San Francisco (Presidio), Ocean Beach, Fort Funston, Fort Mason, Lands End, Sutro Heights, and China Beach. State-owned park lands include the Candlestick Point State Recreation Area and a portion of the Mount Sutro Open Space.[5,6]

Residents of San Francisco also benefit from the Bay Area's regional and local park and open space system. The National Park Service operates the Golden Gate National Recreation Area in Marin, San Francisco, and San Mateo counties, which includes attractions such as Muir Woods National Monument, the Marin Headlands, Fort Point National Historic Site, Alcatraz Island, the San Francisco Maritime National Historical Park, Ocean Beach, and Fort Funston. The Presidio Trust and the National Park Service each operates a portion of the Presidio. Other Federal lands in the region include the Point Reyes National Seashore in Marin County. State park and recreation areas include attractions such as Mount Tamalpais State Park, Angel Island State Park, and the Candlestick Point State Recreation Area. Regional resources also include public open spaces in Alameda and Contra Costa counties owned and operated by the East Bay Regional Park District, open spaces in San Mateo and Santa Clara counties owned and operated by the Midpeninsula Regional Open Space District, and county parks and recreation areas throughout the larger Bay Area. Two multi-county recreational resources, the Bay Trail and the Water Trail, are intended to promote interconnection among all nine Bay Area counties. The Bay Trail is a

[4] San Francisco Planning Department, Recreation and Open Space Element of the *San Francisco General Plan* (hereinafter ROSE), pp. 2-3. Available online at http://www.sf-planning.org/ftp/General_Plan/index.htm. Accessed September11, 2015.

[5] San Francisco Recreation and Parks Department, Interior Greenbelt. Available online at http://sfrecpark.org/wp-content/uploads/IG_Multiuse.pdf. Accessed May 25, 2016.

[6] San Francisco Planning Department, ROSE, pp. 2-5, and San Francisco Recreation and Parks Department, *Recreation Assessment Report*, August 2004, p. 21. Available online at http://www.sf-planning.org/ftp/General_Plan/index.htm and http://sfrecpark.org/wp-content/uploads/SFRP_Summary_Report.pdf. Accessed September 11, 2015.

recreational corridor encircling San Francisco and San Pablo bays with over 345 miles of hiking and bicycle trails; upon completion, it will link 500 miles of trails in a continuous loop. The Water Trail is a network of recreational non-motorized small boat launches encircling San Francisco Bay. Other resources include thousands of acres of watershed and agricultural lands that are preserved as open spaces by water and utility districts or are in private ownership.

San Francisco ranks as one of the top five cities in the country in terms of providing open space and recreation, with over 20 percent of its land area designated as open space.[7] The U.S. Census Bureau's 2010 population for San Francisco was 805,235, which equates to a ratio of roughly 7.3 acres of open space per 1,000 residents. According to the U.S. Census Bureau's 2013 American Community Survey population estimates, San Francisco's population has steadily increased since 2010, to 817,501, yielding a ratio of approximately 7.2 acres of open space per 1,000 residents for 2013.[8] Although the National Park and Recreation Association formerly called for 10 acres of open space per 1,000 City residents, it no longer recommends a single absolute "average" of park acreage per population, in recognition of the fact that it is more relevant that each area plan and program facilities be based upon community need. More important than total acreage is accessibility (location, walking distance) and whether the facility provides needed services to the population in question.

The City has not established a Citywide target ratio of open space to residents in acknowledgement of the constraints posed by the combination of geography, high land costs, increasing population density, and the pace of infill urban development. The ROSE update (April 2014) addresses this policy shift from total acreage to accessibility and service area demand. Under Policy 2.1 of the ROSE, later described in Regulatory Framework, p. 4.J.23, the City identified a need to prioritize the acquisition and renovation of open space in high needs areas, defined as areas with high population density, high percentages of children, seniors, or low-income households, and where the most growth is projected to occur between now and 2040, relative to the City as a whole. In addition, in November 2012, San Francisco residents voted to approve the 2012 Clean and Safe Neighborhood Parks General Obligation Bond (2012 Clean and Safe Parks Bond), which provided additional funding to continue capital projects aimed at the renewal, expansion, and repair of existing City-owned park, recreation, and open space assets. The 2012 Clean and Safe Parks Bond continued efforts initiated with the 2008 Clean and Safe Parks Bond. The bond included funding for improvements to 15 neighborhood parks and as well as renovations to, and creation of, waterfront open spaces including the Potrero Hill Recreation Center, Agua Vista Park, and future Crane Cove Park (described in the bond as the "Pier 70

[7] San Francisco Planning Department, ROSE, p. 2. Available online at http://www.sf-planning.org/ftp/General_Plan/index.htm. Accessed September11, 2015.

[8] U.S. Census Bureau, 2009-2013 5-Year American Community Survey, San Francisco County, American Community Survey Demographic and Housing Estimates. Available online at http://factfinder.census.gov/rest/dnldController/deliver?_ts=461008993623. Accessed September 22, 2015.

Shoreline"); long-awaited investments in Golden Gate Park, John McLaren Park, the Lake Merced Community Complex and Citywide programs such as the Failing Playgrounds, Community Opportunity, and Park Trails Improvement Funds; and renovations to park infrastructure to promote water conservation (irrigation) and enhance safety (tree maintenance). As of 2015 there are nearly 100 active capital projects.[9]

NEARBY PARKS AND RECREATIONAL FACILITIES

Parks and Recreational Facilities

The analyses in California Environmental Quality Act (CEQA) documents typically present existing and existing-plus-project scenarios to compare conditions with the Proposed Project to existing conditions. However, as described in Section 4.A, Introduction to Chapter 4, pp. 4.A.5-4.A.12, because the Pier 70 area is changing rapidly, and development and infrastructure projects were recently completed, were under construction at the time the Notice of Preparation (NOP) was published, or have been approved and funded and are expected to be under construction or completed by the time the Proposed Project is under construction, a baseline other than existing conditions is used for analyses presented in this section. The modified existing conditions that serve as the baseline conditions account for these projects. (See Table 4.J.1: Existing and Baseline Parks and Recreational Facilities Near the Project Site.)

As described in Chapter 2, Project Description, pp. 2.17-2.18, the 28-Acre Site and Illinois Parcels (the project site) currently contain approximately 351,800 gross square feet (gsf) of mostly vacant buildings and facilities. Current uses on the project site include special event venues, artists' studios, self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, and office spaces. The 28-Acre Site is most commonly traversed by workers and other visitors to these commercial uses, including the Building 12 complex and the paved lot to the west of the complex when the complex is used as a temporary space for community, arts and cultural, and special events. Within the 28-Acre Site, there are no existing pedestrian or bikeway facilities that provide recreational access to San Francisco Bay waterfront, pier, or slipways.

The project site is located near City-owned parks and recreational facilities and linear pedestrian and bikeway recreational resources that attract local residents and regional and Citywide visitors. (See Figure 4.J.1: Existing, Baseline, and Future Parks and Recreational Facilities.) No POPOS are located within a 0.5-mile radius of the project site.[10]

[9] San Francisco Recreation and Parks Department, Active Capital Projects, 2015. Available online at http://sfrecpark.org/park-improvements/currentprojects/. Accessed September 22, 2015.

[10] San Francisco Planning Department, Privately-Owned Public Open Space and Public Art, 2015. Available online at: http://www.sf-planning.org/index.aspx?page=3339. Accessed December 10, 2015.

Table 4.J.1: Existing and Baseline Parks and Recreational Facilities Near the Project Site

Facility Name	Open Space Size (Acres)	Distance and Direction from Project Site (Miles)
Existing Recreational Facilities		
Potrero Hill Recreation Center[a] is owned and managed by RPD. It is located in the Potrero Hill neighborhood at 801 Arkansas Street. The park features both active and passive uses and includes a recreation center, playground, baseball field, basketball court, ball fields, two lighted tennis courts, picnic tables, and barbeque grills. The indoor recreation center has a computer room, gymnasium, stage, and auditorium.	9.5	0.5 west
Existing Parks		
Esprit Park is owned and managed by RPD. It is located in the Dogpatch neighborhood and occupies the entire block bordered by Minnesota, Indiana, 19th, and 20th streets. It features both active and passive uses and includes a grass field bordered with picnic tables, benches, redwood trees, and an athletic circuit.	1.8	0.2 west
Warm Water Cove[b] is owned by the Port. It is located at the end 24th Street, east of Illinois and Third streets. It features walking paths, landscaped lawns, benches, and scenic vistas of the bay and adjacent piers and warehouses.	1.85	0.2 south
Woods Yard Park is owned by the San Francisco Municipal Transportation Agency. It is located on the southeastern corner of Indiana and 22nd streets and is a block-long open space with two grassy areas, shade trees, and a playground with a sand pit.	0.25	0.2 west
Potrero Hill Mini Park is owned and managed by RPD. It features an off-leash dog run and is adjacent to the Potrero Hill Recreation Center.	0.3	0.5 west
Agua Vista Park[c,d] is a landscaped park and fishing pier owned by the Port. It is located on the east side of Terry A. Francois Boulevard between 16th and Mariposa streets in Mission Bay and has picnic tables and views of adjacent ship repair uses. It includes a 600-foot-long portion of the Bay Trail.	0.5	0.4 north
Bayfront Park[d] is a park in development comprised of four parcels owned by the Port in the Mission Bay Redevelopment Area (P21, P22, P23, and P24).[e] Completed features are located east of Terry A. Francois Boulevard between South and Mariposa streets and include a boat launch with a parking area (P21) and a 1,290-foot-long, 8-foot-wide portion of the Bay Trail (P21 and P22). Additional development of P22, and new development of P23 and P24 are discussed below, under Additional Baseline Parks.	2.01	0.5 north
The **Connecticut** and **Arkansas Friendship Gardens** are managed by the RPD Urban Garden Program. The gardens are adjacent to the Potrero Hill Recreation Center at 801 Arkansas Street and feature vegetables, fruit trees, flowers, and beehives.	0.25	0.5 west
Total[e]	**16.46**	

Table 4.J.1 Continued

Facility Name	Open Space Size (Acres)	Distance and Direction from Project Site (Miles)
Existing Community Organized Spaces[f]		
Progress Park is located in the Dogpatch neighborhood on Indiana Street between 23rd and 25th streets. It features active and passive uses including meandering paths, benches, a pull-up bar, a bocce court, and a fenced off-leash dog area.	1	0.4 southwest
The **Pennsylvania Street Gardens** are located at 251 Pennsylvania Avenue at 18th Street in the Potrero Hill neighborhood alongside the Mariposa Street off ramp owned by Caltrans. It is managed by the non-profit Pennsylvania Street Gardens.	1	0.4 northwest
Tunnel Top Park is located at the corner of 25th Street and Pennsylvania Avenue. The park features a native plant garden, community gathering square, seating areas, and public art.	0.69	0.5 southwest
Total	**2.69**	
Additional Baseline Parks		
Bayfront Park is a park in development comprised of four parcels owned by the Port in the Mission Bay Redevelopment Area (P21, P22, P23, and P24). P21 and portions of P22 are complete (2.01 acres), as discussed above in Existing Parks. An additional 5.22 acres would be developed on P22 to include a new grass lawn and other amenities to complement the existing trail and waterfront. P23 (0.76 acre) and P24 (1.13 acres) are two triangular parcels located west of Terry A. Francois Boulevard between Mariposa and 16th streets that would also be developed into new park space.	7.11	0.5 north
Mariposa Park is comprised of two parcels owned by the City in the Mission Bay Redevelopment Area totaling 2.38 acres (P26 and P27). The park, located north of Mariposa Street between Minnesota Street and I-280, is currently under construction and would provide a grass lawn and walking paths, a kids' play area, benches, and tables.	2.38	0.3 northwest
The approved **800 Indiana Street** project includes a new 3,500-gsf public plaza.	0.1 (3,500 gsf)	0.2 west
The approved **650 Indiana Street** project includes a new 8,900-gsf public plaza at the corner of Indiana and 19th streets.	0.2 (8,900 gsf)	0.2 northwest
The approved **20th Street Historic Core** project includes an outdoor publicly accessible plaza.	1	Adjacent to the project site (north)
Total	**10.79**	

Table 4.J.1 Continued

Facility Name	Open Space Size (Acres)	Distance and Direction from Project Site (Miles)

Notes:

gsf = gross square feet

RPD = San Francisco Recreation and Parks Department

[a] Potrero Hill Recreation Center was included in the 2012 Clean and Safe Parks Bond. Proposed improvements to the natural turf playfields and the dog play area are expected to be completed by July 2018.

[b] Warm Water Cove may be expanded in conjunction with the redevelopment of the Potrero Power Plant and Pier 70 identified in the ROSE. It was also included in the 2012 Clean and Safe Parks Bond with proposed improvements to include construction of a new public access with a walkway and scenic lookouts. The San Francisco Blue Greenway, described below, would be routed through Warm Water Cove from the planned Power Plant Shoreline Access to the north to Islais Creek North-West to the south.

[c] Agua Vista Park was included in the 2012 Clean and Safe Parks Bond with proposed improvements to renovate and provide shoreline access with walking, biking, and viewing areas.

[d] This portion of the Bay Trail alignment is shared by the San Francisco Blue Greenway.

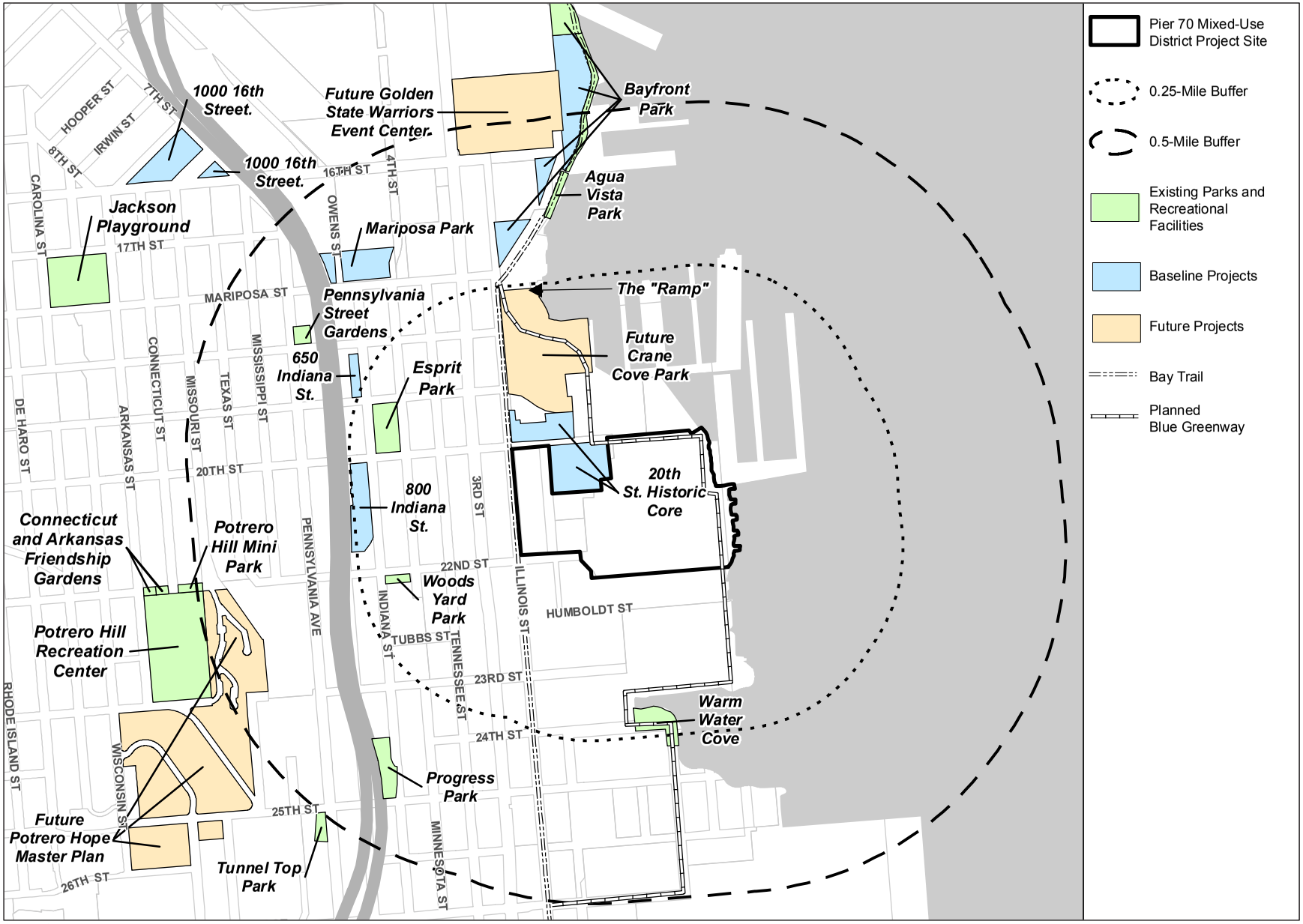
[e] All public open space parcels mapped in the 2014 Mission Bay Land Use Plan are given numeric parcel designations such as P1, P2, P3, etc.

[f] These three community organized spaces are not counted in the total acreage because they are not part of the City-owned open space system.

Sources: San Francisco Planning Department, Property Information Map & Database; San Francisco Recreation and Parks Department, Parks & Open Space and Recreation & Services; and Port of San Francisco, Parks and Open Spaces. Available online at http://propertymap.sfplanning.org/?dept=planning, http://sfrecpark.org, and http://www.sfport.com/index.aspx?page=60. Accessed December 10, 2015.

Within San Francisco, open spaces are categorized according to their particular amenities, e.g., sports field, recreation center, or playground, and their walkability. Open space designated in the ROSE as Active Use/Sports Field or Passive Use/Tranquil Spaces, as well as open spaces proposed for large plan areas such as Mission Bay, Park Merced, Treasure Island, and Hunters Point Shipyard/Candlestick Point, are considered walkable (a 10-minute walk) to users within a 0.5-mile radius. Although the Central Waterfront area of the City may have pedestrian obstacles – such as steep topography toward Potrero Hill west of I-280, discontinuous sidewalks, or missing crosswalks – it is assumed that all parks and recreational facilities within a 0.5-mile radius could be used. Playgrounds, on the other hand, are considered walkable (a 5-minute walk) within only a 0.25-mile radius, in consideration of families with toddlers and young children.[11] Active recreation refers to a mix of uses in a neighborhood park that includes the following types of facilities: athletic fields, buildings or structures for recreational activities, concessions, community gardens, courses or sport courts, children's play areas, dog play areas, or bike paths. A passive recreation area refers to a mix of uses in a park, undeveloped land, or minimally improved lands that can include the following: landscaped areas, natural areas, ornamental gardens, non-landscaped green spaces, stairways, decorative fountains, picnic areas, and water bodies without recreational staffing.

[11] San Francisco Planning Department, ROSE, p. 20-21. Available online at http://www.sf-planning.org/ftp/General_Plan/index.htm. Accessed September11, 2015.



Source: San Francisco Parks and Recreation (2016)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.J.1: EXISTING, BASELINE, AND FUTURE PARKS AND RECREATION FACILITIES

There are also a number of open spaces just outside a walkable distance from the project site (i.e., beyond the 0.5-mile radius of the project site), including the 4.4-acre Jackson Playground and the 1-acre Daggett Place Park. Jackson Playground occupies two City blocks and is bounded by 17th Street to the north, Mariposa Street to the south, Carolina Street to the west, and Arkansas Street to the east. The park includes a children's play area, picnic tables, tennis and basketball courts, a small community garden, a recreation center with a wooden gym floor and public restrooms, and two baseball fields with bleachers, team benches, and two small storage buildings. Daggett Place Park is a baseline park in the Daggett Street right-of-way developed as part of the 1000 16th Street project. The privately funded open space features large lawns, seating, play areas, a fenced-off dog run, and public art installations. It is owned by the City and will be maintained in perpetuity by the building management of the property.

Bikeway, Trail, and Water Trail Resources

Within the existing project site, there are no formal bicycle or walking trails. Illinois Street, which forms the western boundary of the project site, is an on-street segment of the Bay Trail as identified in regional and local trail planning documents. Nearby bicycle and walking trail plans are described below.

Bay Trail

The Bay Trail is a planned 500-mile hiking and bicycling path that would encircle San Francisco and San Pablo bays and follow the shoreline of 9 counties, pass through 47 cities, and cross 4.5 toll bridges. Approximately 345 miles of the Bay Trail have been completed, including off-street paved trails, dirt/gravel trails, and on-street pathways. The Bay Trail provides scenic recreation for hikers, joggers, bicyclists, skaters, and wheelchair users. It also offers a setting for wildlife viewing and environmental education, and serves as a commute alternative for bicyclists. Within San Francisco, several segments of the Bay Trail are complete, including an on-street segment that runs in a north-south direction from China Basin to Terry A. Francois Boulevard and Illinois Street where it crosses the Islais Creek Channel. Illinois Street is immediately west of the project site and is included as a segment of the Bay Trail.

San Francisco Blue Greenway

The San Francisco Blue Greenway is a project to improve and expand the public open space network along the City's Central and Southern Waterfront from the China Basin Channel to the San Francisco County Line. The San Francisco Parks Alliance began planning the Blue Greenway in 2004 as part of an effort to complete a 13-mile portion of the Bay Trail from China

Basin in the north to Candlestick Point State Recreation Area in the south.[12] Portions of the Blue Greenway have already been completed, such as Heron's Head Park and Warm Water Cove. Illinois Street is included as a Linking Street[13] in the Blue Greenway connecting Mission Bay and Bayview Hunters Point. In addition, a planned shoreline segment of the Blue Greenway, between the future Crane Cove Park to the north and the existing Warm Water Cove Park to the south, is mapped in the ROSE and extends through the project site. This shoreline trail would connect with a waterfront park, planned as part of the Proposed Project, and the future Power Plant Shoreline Access to the south of the project site.[14]

San Francisco Bay Area Water Trail

The San Francisco Bay Area Water Trail is a network of existing and new launch and water landing sites for people in non-motorized boats and beachable sailboats.[15] The *Enhanced Water Bay Area Trail Plan* (*Enhanced Water Trail Plan*) identifies three key water access points near the project site:

1. The Pier 52 Boat Launch, an existing public boat launch, ramp, and float at Terry A Francois Boulevard in Mission Bay approximately 0.7 mile north of the project site;
2. The "Ramp," a privately owned restaurant (The Ramp Bar and Restaurant) with an existing walk-up boat launch that serves as a destination at Mariposa and Illinois streets approximately 0.25 mile north of the project site; and
3. Islais Creek, an existing waterfront park and launch at Quint Street and Cargo Way approximately 0.7 mile south of the project site.[16]

The "Ramp" waterfront access point consists of a paved footpath off Illinois Street that is accessible only to pedestrians and boaters carrying small non-motorized boats such as kayaks and canoes. The future Crane Cove Park project would provide a new landing and launching area south of the facility consisting of a sandy shoreline bordered by riprap for non-motorized boat users.

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[12] San Francisco Parks Alliance, Blue Greenway History. Available online at http://www.sfparksalliance.org/our-work/blue-greenway/history. Accessed November 11, 2015.

[13] The Blue Greenway Design Standards define Linking Streets as streets that connect between individual open spaces and generally run parallel to the shoreline edge alongside the Port's southern waterfront.

[14] San Francisco Planning Department, ROSE, p. 27. Available online at http://www.sf-planning.org/ftp/General_Plan/index.htm. Accessed September11, 2015.

[15] California State Coastal Conservancy, *Enhanced San Francisco Bay Area Water Trail Plan*, December 2011, p. 1. Available online at http://sfbaywatertrail.org/wp-content/uploads/2015/05/Enhanced-Water-Trail-Plan-Dec2011.pdf. Accessed November 11, 2015.

[16] California State Coastal Conservancy, *Enhanced San Francisco Bay Area Water Trail Plan*, December 2011, p. 57-70. Available online at http://sfbaywatertrail.org/wp-content/uploads/2015/05/Enhanced-Water-Trail-Plan-Dec2011.pdf. Accessed November 11, 2015.

Existing Recreation Demand

Demand in the Project Area

Existing residents and workers in San Francisco generate local demand for parks and open space. As of the 2010 U.S. Census, the residential population within 0.5 mile of the project site was approximately 5,168 persons.[17] Adjusted for the approximately 1.5 percent annual increase in the total population of San Francisco between 2010 and 2013, the 2013 population within 0.5 mile of the project site is estimated to be 5,404 persons.[18] As shown in Table 4.J.1 on pp. 4.J.5-4.J.7, there are approximately 16.46 acres of existing public recreation and open space areas within 0.5 mile of the project site; however, Progress Park and the Pennsylvania Street Gardens are not considered in this total because they are not City-owned. Based on the estimated 2013 population within 0.5 mile of the project site, the existing ratio of open space to residents is approximately 3.1 acres per 1,000 residents, which is less than both the 2013 Citywide ratio of approximately 7.2 acres per 1,000 residents and the ratio of 10 acres per 1,000 residents formerly suggested by the National Park and Recreation Association.

Demand on Nearby Existing Parks and Recreation Facilities

The existing residential population within a 0.5-mile radius of existing City-owned park and recreation facilities, referred to as the service population, is estimated based on U.S. Census data for 2010, as shown in Table 4.J.2: Estimated Service Population for Parks and Recreation Facilities Near the Project Site. The service population for 2013 was derived by applying a 1.5 percent annual growth rate to the 2010 Census data of all census block groups in or partially within a 0.5-mile radius of each park or recreation facility.

These service population estimates reinforce the understanding that the distribution of existing land uses strongly influences the baseline population within accessible distance of recreational resources. Warm Water Cove, surrounded by San Francisco Bay shoreline and existing industrial and commercial uses, has the smallest baseline residential population demand. By contrast, Potrero Hill Recreation Center, located in the predominantly residential Potrero Hill neighborhood, has a substantially greater baseline population than Warm Water Cove. Appropriate for its location, the Potrero Hill Recreation Center has the greatest acreage and

[17] The search area was selected based on a 0.5-mile radius buffer around the project site which represents an approximately 10-minute walk from the project site. Based on the 2010 U.S. Census, the total (residential) population of the 123 census blocks located within a 0.5-mile radius of the project site is 5,168 persons.

[18] Estimated increase in population is based on San Francisco's 2010 U.S. Census population of 805,235, compared to the 2009-2013 5-Year American Community Survey estimate of 817,501.

Table 4.J.2: Estimated Service Population for Parks and Recreation Facilities Near the Project Site

Facility Name	Length/ Acres	2010 Service Population[a]	2013 Service Population[b]
Existing Recreational Facilities			
Potrero Hill Recreation Center	9.50	12,174	12,730
Existing Parks			
Esprit Park	1.80	7,139	7,465
Warm Water Cove	1.85	1,049	1,097
Woods Yard Park	0.25	2,264	2,367
Potrero Hill Mini Park[c]	0.30	12,174	12,730
Agua Vista Park[d]	0.50	4,586	4,795
Bayfront Park[d]	2.01	4,586	4,795
Connecticut and Arkansas Friendship Gardens[c]	0.25	12,174	12,730
Total[e]	**16.46**		
Additional Baseline Parks[f]			
Mariposa Park	2.38	7,122	7,447
Bayfront Park[d,g]	7.11	4,586	4,795
800 Indiana Street project	0.10	8,063	8,431
650 Indiana Street project	0.20	7,600	7,947
20th Street Historic Core project	1.00	1,939	2,028
Total	**10.79**		

Notes:

[a] The total residential population of the search area, the service population, was determined based on 2010 Census data of all census block groups in or partially within a 0.5-mile radius of each park or recreation facility.

[b] Based on a 1.5 percent Citywide annual growth factor over a 3-year period.

[c] The Potrero Hill Recreation Center, Potrero Hill Mini Park, and Connecticut and Arkansas Friendship Gardens are adjacent to one another and are considered to serve same population.

[d] Agua Vista Park and Bayfront Park are adjacent and considered to serve the same population.

[e] This total does not include the 1-acre Progress Park or the 1-acre Pennsylvania Street Gardens because they are not owned or operated by the City.

[f] Additional baseline parks were not in service as of May 2015 when the Notice of Preparation was published. As such, service populations are provided for comparative purposes only.

[g] This 7.11-acre portion of Bayfront Park would be constructed in addition to the existing 2.01-acre facilities in the same vicinity, and is considered to serve the same population.

Source: San Francisco Planning Department, Property Information Map & Database; San Francisco Recreation and Parks Department, Parks & Open Space and Recreation & Services; and Port of San Francisco, Parks and Open Spaces. Available online at http://propertymap.sfplanning.org/?dept=planning, http://sfrecpark.org, and http://www.sfport.com/index.aspx?page=60. Accessed December 10, 2015.

diversity of parks and recreation facilities to serve its residents. This also supports the view that waterfront open spaces, such as Warm Water Cove, are City-serving open spaces because they possess unique attributes that attract residents and visitors from across the City.

Demand is also influenced by each recreation facility's unique amenities, services provided, accessibility, and existing level of maintenance. A neighborhood with access to a variety of facilities can provide users with an adequate choice of activities, thereby more evenly distributing recreation demand across facilities. On the other hand, a neighborhood with few, sparse facilities may not be able to sufficiently accommodate the demand or needs of its residents. In addition, a recreation resource may be desirable, but facilities in poor condition may be considered a safety hazard, a nuisance, or blight, and users may be discouraged from using that recreation resource.

In Fiscal Year 2014-2015, RPD reported that 50 percent of its budget was allocated to park maintenance, 25 percent to recreation and aquatics, and 10 percent to structure maintenance.[19] RPD staff and resources for park maintenance are organized into seven regions: Golden Gate Park plus six Park Service Areas (PSAs). RPD rates the condition of each of their plazas, squares, mini parks, neighborhood parks, playgrounds, parkways, and regional parks on a quarterly basis unless the recreation resource is closed for renovations. RPD-managed parks within 0.5 mile of the Proposed Project include Potrero Hill Recreation Center, Esprit Park, and Woods Yard Park.

Park evaluation scores are based on performance standards for 12 categories of park features: athletic fields, buildings and general amenities, children's play areas, dog play areas, greenspace, hardscape, lawns, ornamental beds, outdoor courts, restrooms, table seating areas, and trees.[20] Each feature is evaluated based on the condition and performance standard of various "elements" such as cleanliness, drainage, litter and debris, plant condition, waste receptacles, potholes, signage, weeds, and vandalism. For example, a lawn feature would have an element of mowing with a performance standard requiring that turf be less than 4.5 inches high. If an evaluator finds sufficient turf that is taller than the standard, then he or she would report this condition. Each element is ultimately scored based on the conditions reported.[21] Each feature's score is determined by the number of "passing" elements divided by the total number of elements.

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[19] San Francisco Recreation and Parks Department, Fiscal Year 2014-2015 Budget Presentation, p. 13. Available online at http://sfrecpark.org/wp-content/uploads/Public-Budget-Presentation-V.-2.pdf. Accessed September 11, 2015.

[20] City and County of San Francisco, Office of the Controller, Park Maintenance Standards: Fiscal Year 2014-2015 Annual Report, November 24, 2015, p. 6. Available online at http://openbook.sfgov.org/webreports/details3.aspx?id=2227. Accessed December 8, 2015.

[21] City and County of San Francisco, Office of the Controller, Park Maintenance Standards: Fiscal Year 2014-2015 Annual Report, November 24, 2015, p. 27. Available online at http://openbook.sfgov.org/webreports/details3.aspx?id=2227. Accessed December 8, 2015.

Overall park scores are calculated by taking an average of the overall feature scores weighted based on the type of park, such as hardscape weighted for a civic plaza or athletic fields weighted for a neighborhood park.[22]

Park evaluation scores are provided at the City, Supervisorial District, PSA, and facility levels. In Fiscal Year 2014-2015, the Citywide average annual park evaluation score was 85.2 percent, with restrooms receiving the highest score (91.9 percent) and children's play areas receiving the lowest (79.8 percent).[23] Within Supervisorial District 10, which includes the project site, the average annual park evaluation score was 82.2 percent and included three of the lowest scoring parks (Gilman Playground [57.3 percent], Bay View [58.3 percent], and Little Hollywood [74.5 percent]), as well as the second lowest score for children's play areas by district (74.6 percent).[24] Within PSA 2, which includes the project site and overlaps with the northern portion of Supervisorial District 10, the average annual park evaluation score was 87.7 percent, with the Potrero Hill Recreation Center receiving a score of 91.1 percent and Esprit Park receiving a score of 92.7 percent.[25] Woods Yard Park, classified as a mini-park, has not been evaluated by RPD. All other nearby parks are maintained by the Port or community supported.

As stated on p. 4.J.4, the baseline includes projects that were recently completed, under construction at the time the NOP was published, or that have been approved and funded and will be either under construction or completed by the time the Proposed Project is under construction. As such, additional baseline project open spaces did not contribute to the City's overall open space program in 2010 or 2013 and were not available to the public. Nevertheless, for the purposes of comparing the relative residential density of each open space's service area, planned acreage and the estimated 2010 and 2013 service populations of additional baseline open spaces are provided for informational purposes in Table 4.J.2, p. 4.J.12.

[22] City and County of San Francisco, Office of the Controller, Park Maintenance Standards: Fiscal Year 2014-2015 Annual Report, November 24, 2015, p. 30. Available online at http://openbook.sfgov.org/webreports/details3.aspx?id=2227. Accessed December 8, 2015.

[23] City and County of San Francisco, Office of the Controller, Park Maintenance Standards: Fiscal Year 2014-2015 Annual Report, November 24, 2015, pp. 7 and 13. Available online at http://openbook.sfgov.org/webreports/details3.aspx?id=2227. Accessed December 8, 2015.

[24] City and County of San Francisco, Office of the Controller, Park Maintenance Standards: Fiscal Year 2014-2015 Annual Report, November 24, 2015, pp. 7, 11, and 15. Available online at http://openbook.sfgov.org/webreports/details3.aspx?id=2227. Accessed December 8, 2015.

[25] City and County of San Francisco, Office of the Controller, Park Maintenance Standards: Fiscal Year 2014-2015 Annual Report, November 24, 2015, pp. 19 and 48-49 and San Francisco Recreation and Parks Department website, Park Service Area Map. Available online at http://openbook.sfgov.org/webreports/details3.aspx?id=2227 and http://sfrecpark.org/wp-content/uploads/City-Wide-Map-with-Park-Sevice-Area-Info-and-Supervisors-Districts-Lines.pdf. Accessed December 8, 2015.

Demand and deterioration of existing open space are described above based on existing conditions for these open spaces. However, it is assumed that the future availability of additional baseline project open space (10.79 acres) would increase the overall acreage of open space, thereby reducing demand on other existing facilities in their respective neighborhoods, as further described in Impacts and Mitigation Measures on pp. 4.J.27-4.J.46.

RECREATION AND PARK DEPARTMENT RECREATION ASSESSMENT

In 1998, the City initiated the "Great Parks for a Great City Assessment Project" to determine the condition of the park system as well as future needs. In August 2004, RPD published a *Recreation Assessment Report* that evaluated the recreation needs of San Francisco residents.[26] Nine service area maps were developed for this report. The service area maps were intended to assist RPD staff and City decision-makers in assessing where services are offered, how equitable the service delivery is across the City, and how effective the service is in light of the service area's demographics. The maps define service areas by the capacity of the facility as designed and by the facility's actual attendance, not by distance. The maps are provided for ball fields, pools, outdoor basketball courts, multi-use/soccer fields, recreation centers, and tennis courts.[27]

REGULATORY FRAMEWORK

STATE

The Quimby Act

The Quimby Act (California Government Code Section 66477) was established by the California Legislature in 1965 to preserve open space and parkland in the rapidly urbanizing areas of the State. The Quimby Act authorizes local governments to establish ordinances requiring developers of new subdivisions to dedicate land for parks, pay an in-lieu fee, or perform a combination of the two.

[26] San Francisco Recreation and Parks Department, Recreation Assessment Report, August 2004. Available online at http://sfrecpark.org/about/publications/2004-recreation-assessment/. Accessed September 11, 2015.

[27] The *Recreation Assessment Report* maps the service area of each recreation resource based on a half-mile buffer around the center point of each area. Based on the report's analysis, Potrero Hill Recreation Center does not serve the project site. However, for the purposes of the EIR, accessibility is determined based on a half-mile distance from the project site boundary to the perimeter (boundary) of each park or recreational resource.

REGIONAL

San Francisco Bay Conservation and Development Commission

San Francisco Bay Plan

The *San Francisco Bay Plan* (*Bay Plan*) contains policies pertaining to the development of parks and recreational facilities in and near San Francisco Bay and public access to San Francisco Bay. The *Bay Plan* includes specific policies related to the San Francisco Waterfront as well as general policies related to recreation and public access. The *Bay Plan* has two main objectives: (1) to protect…[San Francisco] Bay as a great natural resource for the benefit of present and future generations and (2) to develop…[San Francisco] Bay and its shoreline to their highest potential with a minimum of [San Francisco] Bay filling.[28]

One of the plan's major conclusions is that shoreline areas suitable for priority uses – ports, water-related industry, airports, wildlife refuges, and water-related recreation – exist only in limited amounts, and should be reserved for these purposes. One of its major proposals is that new shoreline parks, beaches, marinas, fishing piers, scenic drives, and hiking or bicycling pathways should be provided in many areas, and the *Bay Plan* notes that San Francisco Bay and its shoreline offer particularly important opportunities for recreational development in urban areas where large concentrations of people now live close to the water but do not have publicly accessible shoreline nearby. As such, it proposes that the highest priority should be given to recreational development in these areas, as an important means of providing immediate help to relieve urban tensions.

General recreation and public access policies of the *Bay Plan* that are relevant to the development of the Proposed Project are summarized below:[29]

- **Recreation Policy IV.1** encourages the provision of diverse and accessible water-oriented recreational facilities, such as marinas, launch ramps, beaches, and fishing piers wherever possible. These facilities should be provided to meet the needs of a growing and diversifying population, and should be well distributed around San Francisco Bay and improved to accommodate a broad range of water-oriented recreational activities for people of all races, cultures, ages, and income levels.
- **Recreation Policy IV.2** encourages preserving waterfront land for parks and beaches to meet future needs, with the understanding that recreational facilities need not be built all at once. Interim use of a waterfront park priority use area prior to its development as a

[28] San Francisco Bay Conservation and Development Commission, San Francisco Bay Plan, Part II, Objectives. Available online at http://www.bcdc.ca.gov/plans/sfbay_plan.shtml. Accessed November 10, 2016.

[29] San Francisco Bay Conservation and Development Commission, San Francisco Bay Plan, Part IV, Development of the Bay and Shoreline: Findings and Policies, Recreation and Public Access. Available online at http://www.bcdc.ca.gov/laws_plans/plans/sfbay_plan.shtml. Accessed September 22, 2015.

park should be permitted, unless the use would prevent the site from being converted to park use or would involve investment in improvements that would preclude the future use of the site as a park.

- **Recreation Policy IV.3** encourages the development of a variety of recreational facilities, such as waterfront parks, trails, marinas, live-aboard boats, nonmotorized small boat access, fishing piers, launching lanes, and beaches. These recreational facilities should be located, improved and managed consistent with detailed standards for the different type of recreational facilities, e.g., general recreation facilities should be as close to major population centers as is feasible and marina facilities should include viewing areas, restrooms, and non-motorized small boat launching facilities.
- **Recreation Policy IV.4** encourages the provision of a variety of recreational opportunities as a strategy for optimizing the use of San Francisco Bay for recreation. Recreational facilities within waterfront parks should include trails that can be used as components of the Bay Trail; bus stops, kiosks and other facilities to accommodate public transit; and public launching facilities for a variety of boats and other water-oriented recreational craft, such as kayaks, canoes, and sailboards. Waterfront parks should include hiking, bicycling, picnic facilities, swimming, environmental, historical and cultural education and interpretation, viewpoints, beaches, and/or fishing facilities. Recreational facilities that do not need a waterfront location, e.g., golf courses and playing fields, should generally be placed inland. Limited commercial recreation facilities, such as small restaurants, should be permitted within waterfront parks provided they are clearly incidental to the park use, are in keeping with the basic character of the park, and do not obstruct public access to and enjoyment of San Francisco Bay. In addition, historic buildings in waterfront parks should be developed and managed for recreation uses to the maximum practicable extent consistent with the *Bay Plan* Map policies and other standards such as provision of public access to the exterior and the interior of the historic structure, where appropriate.
- **Recreation Policy IV.5** encourages the development of interpretive signs for San Francisco Bay resources in waterfront parks, and, where feasible and appropriate, diverse environmental education programs, facilities and community service opportunities, such as classrooms and interpretive and volunteer programs.
- **Recreation Policy IV.6** encourages careful design and landscape treatment for flood control projects to enhance the appearance of shoreline areas and to permit maximum public use of the shores and waters of San Francisco Bay.
- **Recreation Policy IV.8** encourages the comprehensive distribution of signs and other information regarding shipping lanes, ferry routes, U.S. Coast Guard rules for navigation, such as U.S. Coast Guard Rule 9, weather, tide, current and wind hazards, the location of habitat and wildlife areas that should be avoided, and safety guidelines for smaller recreational craft, via marinas, boat ramps, launch areas, personal watercraft and recreational vessel rental establishments, and other recreational watercraft use areas.
- **Public Access Policy IV.2** assures public access to San Francisco Bay via waterfront parks, beaches, marinas, and fishing piers, and encourages, to the maximum extent feasible, the provision of public access to and along the waterfront through every new development in San Francisco Bay or on the shoreline, whether it be for housing, industry, port, airport, public facility, wildlife area, or other use.

- **Public Access Policy IV.3** encourages public access to some natural areas for study and enjoyment with the understanding that some wildlife are sensitive to human intrusion.
- **Public Access Policy IV.8** encourages access to and along the waterfront by walkways, trails, or other appropriate means as well as connections to the nearest public thoroughfare where convenient parking or public transportation may be available.
- **Public Access Policy IV.10** encourages coordination between Federal, State, regional, and local jurisdictions, special districts, and the Bay Conservation and Development Commission (BCDC) to provide appropriately sited, designed and managed public access, especially to link the entire series of shoreline parks, regional trail systems (such as the Bay Trail) and existing public access areas to the extent feasible without additional San Francisco Bay filling and without significant adverse effects on San Francisco Bay natural resources. State, regional, and local agencies that approve projects should assure that provisions for public access to and along the shoreline are included as conditions of approval and that the access is consistent with BCDC's requirements and guidelines.

The *Bay Plan* identifies priority uses for the San Francisco Bay shoreline. These priority uses are identified on the *Bay Plan* maps and are defined as Ports, Water-related Industry, Water-oriented Recreation, Airports, or Wildlife Refuges. Some of these priority use areas surpass BCDC's permit jurisdiction that consists of land within 100 feet of the San Francisco Bay shoreline. According to *Bay Plan* Map No. 5 (Central Bay),[30] Pier 70 is part of the "Central Basin" and is identified as a Water-related Industry priority use area. Policies related to this area are further specified in the *San Francisco Waterfront Special Area Plan*, as described below. The Proposed Project would not include development that would be inconsistent with *Bay Plan* recreation and public access policies (see Chapter 3, Plans and Policies, p. 3.11).

San Francisco Waterfront Special Area Plan

The *San Francisco Waterfront Special Area Plan* was adopted by BCDC on April 3, 1975, to provide detailed planning and regulatory guidelines for the waterfront of San Francisco from the east side of Hyde Street Pier to the south side of India Basin. It applies the requirements of the McAteer-Petris Act[31] and the provisions of the *Bay Plan* to the San Francisco waterfront in greater detail. Among many goals and policies, the primary recreational purpose of the *San Francisco Waterfront Special Area Plan* is to increase public use and enjoyment of San Francisco Bay and the waterfront through the completion of a system of integrated public parks, plazas, pier public access areas, and promenades. Pier 70 is located along the Port of San Francisco's

[30] San Francisco Bay Conservation and Development Commission, *San Francisco Bay Plan*, Part V, The Plan Maps, Plan Map 5-Central Bay. Available online at http://www.bcdc.ca.gov/pdf/bayplan/Plan_Map_5.pdf. Accessed September 11, 2015.

[31] The McAteer-Petris Act serves as the key legal provision under California state law to preserve San Francisco Bay from indiscriminate filling. Available online at http://www.bcdc.ca.gov/laws_plans/mcateer_petris.shtml. Accessed September 11, 2015.

Southern Waterfront, which stretches between China and India basins and contains most of the current maritime activity of the Port of San Francisco.[32] General policies related to public access and open space include the following:

- **Policy 6a:** In accordance with general *Bay Plan* policies, maximum feasible public access should be provided in conjunction with any development in the area covered by this Special Area Plan. Public access should be located at ground or platform level, but minor variations in elevation intended to enhance design of open space may be permitted. Public access should also be open to the sky, although some covering may be allowed if it serves the public areas and does not support structures. Particular attention should be given to the provision of perimeter public access along the platform edge. Other uses may extend to the platform edge subject to the following conditions:
    i) Such uses should enhance the total design of the project, should serve to make the public access more interesting, and should not divert the public way along more than twenty percent (20 percent) of the total platform edge;
    ii) Deviations of the public way from the platform edge should be limited to short distances.
- **Policy 6b:** Development of public access should be required as a condition of permits for new maritime and non-maritime development. The location of such access obtained as a condition of maritime development between Channel Street and India Basin should be guided by the designations for public recreation, open space, and public access, as found on Special Area Plan Maps 5 and 6.

Pier 70, on Special Area Plan Map 6 of the *San Francisco Waterfront Special Area Plan*, is not specifically designated as a Public Recreation and Access area.

In addition, the *San Francisco Waterfront Special Area Plan* includes geographic-specific policies. Policies specific to Pier 70, which is located within the Pier 48 through India Basin segment of the Southern Waterfront, state that the permitted uses on new or replacement fill (subject to policies) include Maritime, Public Access, and Marina uses.

Association of Bay Area Governments Bay Trail

The *Bay Trail Plan* proposes development of a 500-mile regional hiking and bicycling trail around the perimeter of San Francisco and San Pablo bays. The *Bay Trail Plan* was prepared by the Association of Bay Area Governments (ABAG) pursuant to Senate Bill 100, which mandated that the Bay Trail provide connections to existing park and recreation facilities, create links to existing and proposed transportation facilities, and be planned in such a way as to avoid adverse

[32] San Francisco Bay Conservation and Development Commission, *San Francisco Waterfront Special Area Plan*, April 2012, pp. 9 and 47. Available online at http://www.bcdc.ca.gov/pdf/sfwsap/SFWSAP_Final_2012.pdf. Accessed September 11, 2015.

effects on environmentally sensitive areas.[33] The *Bay Trail Plan* also contains five categories of policies to guide selections of the trail route and implementation of the trail system, comprising trail alignment, trail design, environmental protection, transportation access, and implementation policies.

Enhanced Water Trail Plan

The *Enhanced Water Trail Plan*, led by the State Coastal Conservancy, strives to create a network of launch and landing sites, or "trailheads," to allow people in non-motorized boats and beachable sail craft to enjoy San Francisco Bay.[34] The *Enhanced Water Trail Plan* is a guide to trail implementation for the agencies and organizations that will develop and manage water trail access points and programs, as well as trail proponents and other stakeholders also involved in implementation. Recommended policies and procedures in the *Enhanced Water Trail Plan* define how the water trail will take shape over time by guiding trail planning, development, and management on organizational, programmatic, and trail head project-specific levels.

LOCAL

City of San Francisco

San Francisco General Plan Central Waterfront Area Plan

The project site is within the area encompassed by the *Central Waterfront Area Plan*, which is an element of the *General Plan*. The plan extends the *General Plan* policy directions to the waterfront area where the project site is located, and its objectives and policies provide guidance for development on the project site. Objectives and policies related to the provision of parks and open space are as follows:

Objective 2.3: Require that a significant number of units in new developments have two or more bedrooms except senior housing and SRO [single room occupancy] developments unless all below market rate units are two or more bedroom units.

Policy 2.3.4: Encourage the creation of family supportive services, such as child care facilities, parks and recreation, or other facilities, in affordable housing or mixed-use developments.

[33] San Francisco Bay Trail, *Bay Trail Plan Summary*, 1999. Available online at http://www.baytrail.org/baytrailplan.html. Accessed September 11, 2015.

[34] California State Coastal Conservancy, *Enhanced San Francisco Bay Area Water Trail Plan*, December 2011. Available online at http://sfbaywatertrail.org/wp-content/uploads/2015/05/Enhanced-Water-Trail-Plan-Dec2011.pdf. Accessed September 11, 2015.

Objective 2.5: Promote health through residential development design and location.

Policy 2.5.2: Develop affordable family housing in areas where families can safely walk to schools, parks, retail, and other services.

Objective 3.1: Promote an urban form that reinforces the Central Waterfront's distinctive place in the City's larger form and strengthens its physical fabric and character.

Policy 3.1.8: New development should respect existing patterns of rear yard open space. Where an existing pattern of rear yard open space does not exist, new development on mixed-use-zoned parcels should have greater flexibility as to where open space can be located.

Objective 4.5: Consider the street network in the Central Waterfront as a City resource essential to multi-modal movement and public open space.

Policy 4.5.2: As part of a development project's open space requirement, require publicly accessible alleys that break up the scale of large developments and allow additional access to buildings in the project.

Policy 4.5.5: Reclaim public rights-of-way that have been vacated or incorporated into private parcels.

Objective 4.6: Support walking as a key transportation mode by improving pedestrian circulation within Central Waterfront and to other parts of the City.

Policy 4.6.6: Explore opportunities to identify and expand waterfront recreational trails and opportunities including the Bay Trail.

Objective 4.7: Improve and expand infrastructure for bicycling as an important mode of transportation.

Policy 4.7.1: Provide a continuous network of safe, convenient and attractive bicycle facilities connecting Central Waterfront to the citywide bicycle network and conforming to the San Francisco Bike Plan.

Policy 4.7.3: Support the establishment of the Blue-Greenway by including safe, quality pedestrian and bicycle connections from Central Waterfront.

Objective 5.1: Provide public parks and open spaces that meet the needs of residents, workers and visitors.

Policy 5.1.1: Identify opportunities to create new public open spaces and provide at least one new public open space serving the Central Waterfront.

Policy 5.1.2: Require new residential and commercial development to provide, or contribute to the creation of public open space.

Objective 5.2: Ensure that new development includes high-quality private open space.

Policy 5.2.1: Require new residential and mixed-use residential development to provide on-site private open space designed to meet the needs of residents.

Policy 5.2.2: Establish requirements for commercial development to provide on-site open space.

Policy 5.2.3: Encourage private open space to be provided as common spaces for residents and workers of the building wherever possible.

Policy 5.2.4: Encourage publicly accessible open space as part of new residential and commercial development.

Policy 5.2.5: New development will respect existing patterns of rear yard open space. Where an existing pattern of rear yard open space does not exist, new development on mixed-use-zoned parcels has flexibility as to where open space can be located.

Policy 5.2.6: Ensure quality open space is provided in flexible and creative ways, adding a well-used, well-cared for amenity for residents of a highly urbanized neighborhood. Private open space should meet the following design guidelines:

A. Designed to allow for a diversity of uses, including elements for children, as appropriate.

B. Maximize sunlight exposure and protection from wind.

C. Adhere to the performance-based evaluation tool.

Objective 5.3: Create a network of green streets that connects open spaces and improves the walkability, aesthetics, and ecological sustainability of the neighborhood.

Policy 5.3.1: Redesign underutilized portions of streets as public open spaces, including widened sidewalks or medians, curb bulb-outs, "living streets" or green connector streets.

Policy 5.3.9: Explore opportunities to identify and expand waterfront recreational trails and opportunities including the Bay Trail and Blue-Greenway.

Objective 5.4: The open space system should both beautify the neighborhood and strengthen the environment.

Policy 5.4.1: Increase the environmental sustainability of Central Waterfront's system of public and private open spaces by improving the ecological functioning of all open space.

Policy 5.4.3: Encourage public art in existing and proposed open spaces.

San Francisco General Plan Recreation and Open Space Element

The 2014 ROSE notes that the City's open space is "generally well distributed" but some parts of the City are "still deficient in certain types of open space."[35] It also states that some areas were recently rezoned to support additional residential development and contends that "the future population increase in these areas and throughout the City…will exacerbate current open space deficiencies." Issue areas noted in the ROSE include lack of playground space in many parts of

[35] San Francisco Planning Department, ROSE, p. 20. Available online at http://www.sf-planning.org/ftp/General_Plan/index.htm. Accessed September 11, 2015.

the City, limited capacity for sports fields, and the increased burden on open spaces in high density and lower income population areas.

The ROSE defines "high needs areas" as areas with high population density, high percentages of children, seniors, or low-income households, and where most growth is projected to occur between now and 2040. "Deficient" areas are areas that are not served by public open space, areas with population that exceeds the capacity of the open spaces that serve it, or areas with facilities that do not correspond well to neighborhood needs. High needs areas and deficient areas are identified in the ROSE, based on information from the 2010 U.S. Census, 2007-2011 American Community Survey, and the San Francisco Planning Department Land Use Allocation Analysis 2013. The project site and its surrounding neighborhood are not located within a high needs area. The nearest areas of "greater need" (highest need) are located in the Inner Mission and South of Market. Based on walkability maps included in the ROSE, the project site is generally within a 0.5-mile walkability range of Active Use/Sports Fields and Passive Use/Tranquil Spaces as well as planned Mission Bay open spaces and Port of San Francisco open spaces. In addition, the project site is within a 0.25-mile walkability radius of one playground, Woods Yard Park.

The ROSE contains objectives and policies pertaining to the development of parks and recreational facilities. The following policies are relevant to the Proposed Project:

Objective 1: Ensure a well-maintained, highly utilized, and integrated open space system.

- Policy 1.7: Support public art as an essential component of open space design.
- Policy 1.9: Preserve sunlight in public open spaces.
- Policy 1.10: Ensure that open space is safe and secure for the City's entire population.
- Policy 1.12: Preserve historic and culturally significant landscapes, sites, structures, buildings and objects.

Objective 2: Increase recreation and open space to meet the long-term needs of the City and [San Francisco] Bay region.

- Policy 2.1: Prioritize acquisition of open space in high needs areas.
- Policy 2.2: Provide and promote a balanced recreation system which offers a variety of high quality recreational opportunities for all San Franciscans.
- Policy 2.4: Support the development of signature public open spaces along the shoreline.
- Policy 2.6: Support the development of civic-serving open spaces.
- Policy 2.11: Assure that privately developed residential open spaces are usable, beautiful, and environmentally sustainable.

Objective 3: Improve access and connectivity to open space.

Policy 3.3: Develop and enhance the City's recreational trail system, linking to the regional hiking and biking trail system and considering restoring historic water courses to improve stormwater management.

Policy 3.4: Encourage non-auto modes of transportation—transit, bicycle and pedestrian access—to and from open spaces while reducing automobile traffic and parking in public open spaces.

Policy 3.5: Ensure that, where feasible, recreational facilities and open spaces are physically accessible, especially for those with limited mobility.

Objective 4: Protect and enhance the biodiversity, habitat value, and ecological integrity of open spaces and encourage sustainable practices in the design and management of our open space system.

Policy 4.3: Integrate the protection and restoration of local biodiversity into open space construction, renovation, management, and maintenance.

Policy 4.4: Include environmentally sustainable practices in construction, renovation, management, and maintenance of open space and recreational facilities.

San Francisco Blue Greenway Planning and Design Guidelines

The Blue Greenway is a City project to improve a 13-mile-long portion of the 500-mile, 9-county, region-wide Bay Trail, as well as the newly established San Francisco Bay Area Water Trail and associated waterfront open space system.[36] The alignment of the Blue Greenway generally follows the alignment of the Bay Trail and Bay Area Water Trail north to south from the China Basin Channel to the San Francisco County Line.

The Blue Greenway Planning and Design Guidelines document presents the following elements: Linking and Connector Streets; Signage, Interpretation and Art; Site Furnishings; Planting and Landscape Plan; Port Open Space Use and Program Concepts; and Project Costs and Implementation. The guidelines include conceptual design and use criteria for proposed Port open spaces, including Agua Vista Park, future Crane Cove Park, Pier 70 Slipways Park [now called the Pier 70 Waterfront Terrace, Waterfront Promenade, and Slipways Commons, as part of the Proposed Project], Power Plant Shoreline, and Warm Water Cove Park.[37] The following program uses were identified as appropriate and compatible for the Pier 70 Slipways Park:

[36] Port of San Francisco, Blue Greenway – Planning and Design Guidelines, July 2012, p. 1.1. Available online at http://www.sf-port.org/modules/showdocument.aspx?documentid=8344. Accessed September 11, 2015.

[37] Port of San Francisco, Blue Greenway – Planning and Design Guidelines, July 2012, pp. 5-4 and 6-6 to 6-15. Available online at http://www.sf-port.org/modules/showdocument.aspx?documentid=8344. Accessed September 11, 2015.

Waterfront Promenade, fishing pier (possible location of existing pier), viewing platform, picnic areas, public art, plaza, large public gathering areas, playground, passive recreation, restaurant/concessions, and future connection to south (through the former Potrero Power Plant site).[38]

These concepts were developed through a criteria and suitability analysis conducted and described in the Blue Greenway Design Standards and through previous planning processes, including the Port's *Pier 70 Preferred Master Plan*. The intent is that as the planning and design of this open space are refined, the program of uses would also be refined and updated.

Port of San Francisco

Waterfront Land Use Plan and Design and Access Element

More than 7 miles of San Francisco Bay frontage, stretching from the Hyde Street Pier to India Basin, are held in trust for the public under the management of the Port.[39] The Port, as trustee of these public lands, is required to promote maritime commerce, navigation and fisheries, as well as to protect natural resources and develop recreational facilities for public use. Goals set forth by the *Waterfront Land Use Plan* include the following:

- Port lands should host a diverse and exciting array of maritime, commercial, entertainment, civic, open space, recreation and other waterfront activities for all San Franciscans and visitors to enjoy.
- A network of parks, plazas, walkways, open space and integrated transportation improvements should improve access to, and enhance the enjoyment and appreciation of, the Bay environment.

Policies applicable to recreation and open space are as follows:

Policy 1: Ensure a diversity of Open Spaces and Public Access, which may be achieved in different ways depending on location: places that provide access to water; quiet; contemplative places for passive enjoyment; active places for civic gatherings and other urban events that draw large crowds; places for biking and foot race events; places that restore the environment and support wildlife habitats; places to learn about waterfront activities and the Bay environment; and places that appeal to children and seniors.

Policy 4: Provide public access around the perimeter of piers, wherever safe and feasible as indicated in the Waterfront Design & Access Element and the BCDC Special Area Plan.

[38] Port of San Francisco, Blue Greenway – Planning and Design Guidelines, July 2012, p. 6-10 and 6-11. Available online at http://www.sf-port.org/modules/showdocument.aspx?documentid=8344. Accessed September 11, 2015.

[39] Port of San Francisco, Waterfront Land Use Plan. Available online at http://www.sfport.com/index.aspx?page=294. Accessed September 11, 2015.

The *Waterfront Land Use Plan* strongly encourages that, where feasible and consistent with the *Bay Plan* and the Public Trust,[40] new commercial development on piers should be a part of mixed-use developments that include maritime and open space and public access activities, and that bring day and nighttime activity to the waterfront.

Waterfront Design and Access Element

In concert with the *Waterfront Land Use Plan*, the Port's Waterfront Design and Access Element sets forth policies to direct the location and types of public access and open spaces, public view corridors, and historic resources, and also provides site-specific design criteria for San Francisco's waterfront. The element provides specific design and access criteria and objectives for the Pier 70 waterfront, including open space, historic preservation, massing, orientation, and architectural details.[41]

Planning Code Article 4: Development Impact Fees and Project Requirements that Authorize the Payment of In-Lieu Fees

Article 4 of the Planning Code establishes fees to help maintain adequate park capacity required to serve new service population resulting from new development. Fees are used to fund projects that directly increase park capacity either through the acquisition of new park land, or through capacity enhancements to existing parks and open space. Infrastructure impact fees are required for new residential and non-residential uses throughout the Eastern Neighborhoods (Planning Code Section 423). As an alternative means of satisfying the open space requirement of new non-residential uses in the Eastern Neighborhoods Mixed Use Districts (Planning Code Sections 426 and 427), additional open space fees are imposed in certain zoning districts, based on cost per square foot of the net usable open space that is required but not provided.[42] However, the Proposed Project will create an SUD that will be a new zoning district with open space requirements specific to development goals of the site and Planning Code fee requirements on other Eastern Neighborhoods Mixed Use Districts would not apply.

[40] The Public Trust imposes certain use restrictions on historical tidal and submerged lands along the waterfront to protect the interests of the people of the State of California for commerce, navigation, and fisheries, as well as other public benefits recognized to further trust purposes, such as recreation and environmental preservation.

[41] Port of San Francisco, Waterfront Design and Access – An Element of the Waterfront Land Use Plan, 2009. Available online at http://www.sf-port.org/index.aspx?page=293. Accessed September 11, 2015.

[42] San Francisco Planning Department, Impact Fees. Available online at http://sf-planning.org/impact-fees. Accessed June 2, 2016.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on recreation. Implementation of the Proposed Project would have a significant effect on recreation if the project would:

J.1 Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated; or

J.2 Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

APPROACH TO ANALYSIS

In determining whether the Proposed Project would have a significant adverse impact on parks and recreational facilities, this analysis considers adjacent and nearby parks and recreation facilities within a 0.5-mile radius of the project site, the existing capacity of those recreation resources, additional baseline park and recreation facilities yet to be in operation, foreseeable future projects that would include public open space, and the open space that would be included as part of the Proposed Project. The City considers the service area of a neighborhood park to be the area within a 0.5-mile radius of the park (or a 10-minute walk). The distance buffer is indicative of how far a particular type of user would walk, e.g., a family with children will not walk as far as an adult. As a result, a playground's service area is more tightly defined as the area within a 0.25-mile radius of the playground (or a 5-minute walk). Large parks such as Golden Gate Park or parks that possess unique attributes such as waterfront parks are City- and region-serving parks.

The impact analysis considers whether the Proposed Project would lead to substantial physical deterioration of open space near the project site or create the need to build additional recreation facilities. The Maximum Residential Scenario and the Maximum Commercial Scenario are analyzed separately in the impacts evaluation, below, because each scenario would result in different estimated population and employment numbers. The analysis also assumes that the residential populations associated with each of these scenarios are the primary demand generators because residential populations tend to be more intensive users of open space than worker populations. This is primarily due to the limited time that workers have to engage in passive and active recreational pursuits, e.g., an office worker is more likely to use open space for passive recreation during lunch periods and has limited opportunities to use open space that is not easily

accessible. As such, for the purposes of this analysis, it is assumed that new residents under the Maximum Residential Scenario would result in higher intensity park usage than the combined effect of both workers and residents under the Maximum Commercial Scenario.

This analysis assumes that if there are a variety of active and passive recreational activities with sufficient capacity and within a convenient distance of the potential users, there would not be a significant burden on existing parks and recreational facilities such that substantial physical deterioration would occur. It does not assume that a lack of capacity for each type of recreational activity in and of itself would be a significant adverse impact, nor that the incremental population increase resulting from the Proposed Project is the single factor that leads to deterioration or physical degradation of parks and recreational facilities. Other factors include the park design, the age of the infrastructure, how the park is used, and the level of maintenance. Cumulative effects of the Proposed Project's demand for park and open space on the City's overall parks and open space network are also considered.

PROJECT FEATURES

The Proposed Project entails the mixed-use development of the 28-Acre Site and the Illinois Parcels, including residential, commercial-office, and retail/arts/light-industrial uses. Under the provisions of the proposed Special Use District, the Proposed Project would provide a flexible land use program, under which certain parcels could be developed for primarily residential or commercial uses.

In addition, two parcels on the project site that would be designated for structured parking could be developed with either residential or commercial-office uses depending on future market demand and future transportation network changes. If developed as parking, the buildings would have publicly accessible rooftop open space.

The different implementation scenarios (Maximum Residential Scenario and Maximum Commercial Scenario) would have separate effects on recreation. As stated in Section 4.C, Population and Housing, pp. 4.C.20-4.C.21, the Proposed Project would have a residential on-site population of approximately 6,868 residents under the Maximum Residential Scenario (4,881 residents on the 28-Acre Site and 1,987 residents on the Illinois Parcels), and approximately 3,735 residents under the Maximum Commercial Scenario (2,497 residents on the 28-Acre Site and 1,238 residents on the Illinois Parcels). Under both the Maximum Residential and Maximum Commercial scenarios, the proposed uses would displace approximately 60 to 70 existing on-site employees. Under the Maximum Residential Scenario, there would be approximately 5,599 employees, with approximately 5,443 employees at the 28-Acre Site and 156 employees at the Illinois Parcels. Under the Maximum Commercial Scenario, there would be approximately 9,768 employees, with 8,754 employees at the 28-Acre Site and 1,014 employees at the Illinois Parcels. Potential impacts on recreation are analyzed below for both scenarios.

Open Space

The Proposed Project would include 9 acres of public open space under both development scenarios (see Figure 2.15: Proposed Open Space Plan, in Chapter 2, Project Description, p. 2.46) as a public benefit approved by the San Francisco electorate by ballot measure on November 4, 2014 ("Proposition F"). The proposed open space would supplement other existing or planned amenities near the project site, such as the future Crane Cove Park, and would include extensions of the Blue Greenway and Bay Trail along the eastern portion of the 28-Acre Site.

Open spaces would include the Waterfront Promenade, Waterfront Terrace, Slipway Commons, Building 12 Market Plaza and Market Square, Irish Hill Playground, 20th Street Plaza, and potentially Buildings C1 and C2 rooftops, as shown in Table 4.J.3: Proposed Project Open Space Program. (See also "Proposed Open Space Plan," in Chapter 2, pp. 2.45-2.48, and Figure 2.15: Proposed Open Space Plan, p. 2.46.)

In addition to the public open space described above, the Proposed Project would include residential open space in the form of balconies, courtyards, and other facilities accessible only to building occupants.

IMPACT EVALUATION

Impact RE-1: The Proposed Project would increase the use of existing neighborhood and regional parks or other recreational facilities, but not to such an extent that substantial physical deterioration of existing facilities would occur or be accelerated, or such that the construction of new facilities would be required. ***(Less than Significant)***

Under both development scenarios, the Proposed Project would involve the construction of approximately 9 acres of open space. In either the Maximum Residential Scenario or Maximum Commercial Scenario, on-site residents would have the option to use open space that would be provided as part of the Proposed Project. In general, it is likely that residents would travel to the nearest park or recreation facility that provides the services they need. The parks and recreational facilities that would be provided as part of the Proposed Project would be the nearest recreational resources to on-site residents. While these residents would likely use proposed on-site park and recreation facilities, this analysis assumes that they may also use existing and additional baseline parks. Although the Central Waterfront area of the City may have pedestrian obstacles – such as steep topography toward Potrero Hill west of I-280, discontinuous sidewalks, or missing crosswalks – it is assumed that all parks and recreational facilities within a 10-minute walking distance from the project site (about a 0.5-mile radius of the project site) could be used by future on-site residents (see Figure 4.J.1 on p. 4.J.8.)

Table 4.J.3: Proposed Project Open Space Program

Proposed Open Space	Anticipated Features	Approximate Acreage
Waterfront Promenade	• Waterfront pedestrian and bicycle promenade • Café terrace • Picnic and seating terraces • Pier 70 craneway pier structures (fishing and Bayfront viewing) • Viewing pavilions • Event pavilion	1.2
Waterfront Terrace	• Waterfront pedestrian and bicycle promenade • Viewing pavilion • Social lawn • Eating/drinking area • Seating areas	1.0
Slipway Commons[a]	• Café terrace • Event plaza • Viewing pavilion	2.8
Building 12 Market Plaza and Market Square	• Open-air markets • Market stalls • Small performance and gathering space	1.5
Irish Hill Playground	• Children's play areas (play slope and play pad) • Picnic grove • Lounging terrace • Planted slopes and pathways	2
20th Street Plaza	• Terraced seating areas	0.5
Rooftop Open Space Areas[b]	• Sports courts and play fields • Urban agriculture plots • Seating areas • Observational terrace areas	*(1.7)*
	Total	**9.0**

Notes:

[a] In addition to the café terrace, event plaza and viewing pavilion, Slipway Commons would connect rehabilitated Buildings 2, 12, and 21 to the waterfront.

[b] Rooftop Open Space Areas are subject to development of Parcels C1 or C2 as district parking. Acreage of Rooftop Open Space Areas would be in addition to the 9 acres of public open space at the project site.

Source: *Draft Pier 70 SUD Design for Development*, October 2, 2015

Citywide Context

As described in Environmental Setting, p. 4.J.1, San Francisco contains approximately 5,890 acres of existing publicly accessible open space. Approximately 11 acres of additional open space would be provided as a result of the completion of the additional baseline projects, as listed in Table 4.J.1, pp. 4.J.5-4.J.7, for a Citywide total of over 5,900 acres. Using 2013 ACS population estimates, the Citywide amount of acres of open space per 1,000 San Francisco residents under baseline conditions (including both existing and additional baseline parks) would be 7.22 acres per 1,000 residents. As a result of the Proposed Project, the total residential population would increase under either the Maximum Residential Scenario or the Maximum Commercial Scenario, as shown in Table 4.J.4: Citywide Open Space Ratio as a Result of the Proposed Project. The total acreage of open space in San Francisco would increase by 9 acres with implementation of the Proposed Project. As such, the Proposed Project population increase and open space increase would result in a less than 1 percent change to the citywide open space ratio compared to baseline conditions under either the Maximum Residential Scenario (0.7 percent) or the Maximum Commercial Scenario (0.3 percent).

Table 4.J.4: Citywide Open Space Ratio as a Result of the Proposed Project

	Existing Plus Baseline[a]	Proposed Project (Maximum Residential Scenario)	Proposed Project (Maximum Commercial Scenario)
Citywide Population (residents)	817,501	824,369	821,236
Citywide Open Space (acres)	5,900.79	5,909.79	5,909.79
Citywide Ratio of Open Space to Population (acres per 1,000 residents)	7.22	7.17	7.20

Notes:

[a] Additional baseline projects are either under construction or planned. For comparison purposes, the 2013 American Community Survey population estimate is used. It is assumed that at the time each additional baseline project is constructed, the Citywide population will have changed for that year.

Source: 2013 American Community Survey

Despite the relative lack of change to the Citywide ratio of open space to residents, it is more relevant to discuss the project-level impact to parks and recreational facilities based on the local area, or neighborhood, and its facilities. The accessibility (location, walking distance) and availability of services provided by neighborhood park and recreation facilities would be most perceptible to the nearby community. As such, the following discussion describes the local context of potential environmental effects to recreation for both the Maximum Residential Scenario and the Maximum Commercial Scenario.

Local Context

As described above under "Existing Recreation Demand," pp. 4.J.11 -4.J.15, the project site is located in Supervisorial District 10, which has a relatively low concentration of public parks and recreational facilities, and a lower average park evaluation score as compared to other areas of San Francisco. Existing City-owned facilities managed by RPD, the San Francisco Municipal Transportation Agency, or the Port within a 0.5-mile radius of the project site (Esprit Park, Warm Water Cove Park, Woods Yard Park, Potrero Hill Recreation Center, Potrero Hill Mini Park, Connecticut and Arkansas Friendship Gardens, Agua Vista Park, and Bayfront Park amenities at P21 and P22) provide approximately 16.46 acres of existing parks and recreation space. The additional baseline projects (Mariposa Park; additional Bayfront Park development at P22, P23, and P24; 650 Indiana Street; 800 Indiana Street; and 20th Street Historic Core projects) would also contribute a total of approximately 10.79 acres of open space. Existing and baseline conditions contribute a total of approximately 27.25 acres of open space. In addition, 2.69 acres of existing community-organized open space, and non-City owned facilities also fall within the same distance buffer, Progress Park, Pennsylvania Street Gardens, and Tunnel Top Park (see Figure 4.J.1 on p. 4.J.8); however, they are not publicly maintained facilities and are not considered further in this evaluation. Among the goals of the Proposed Project is to provide a variety of parks and recreational facilities and to improve public access to the shoreline to create a well-rounded open space destination. With the addition of 9 acres of parks and recreational facilities, implementation of the Proposed Project would increase the total open space acreage on and within a 0.5-mile radius of the project site to approximately 36.25 acres.

An increase in the local population could contribute to or accelerate the deterioration of existing parks and recreational facilities if the demand generated by the new residents were to create an overuse of existing facilities. In particular, amenities such as grass sports fields or play structures are more susceptible to deterioration than more resilient hardscape facilities, such as concrete bicycle pathways. Changes in population as a result of the Proposed Project (in either the Maximum Residential Scenario or the Maximum Commercial Scenario) to the service areas of each park within a 0.5-mile radius of the project site are detailed in Table 4.J.5: Change in Service Population for Existing and Baseline Parks and Recreation Facilities near the Project Site as a Result of the Proposed Project. In an effort to state the maximum potential impact of the Proposed Project on nearby parks and recreation facilities, the service population analysis below conservatively assesses demand without including the effect of the Proposed Project's open space on meeting demand for existing recreation resources. As stated above, there is a possibility that the Proposed Project, in providing new on-site open space, may decrease future demand on existing parks and recreation facilities near the project site despite population growth on the project site and in the project area.

Table 4.J.5: Change in Service Population for Existing and Baseline Parks and Recreation Facilities near the Project Site as a Result of the Proposed Project

Facility Name	Open Space Area (acres)	2013 Service Population[a,b]	Proposed Project (Maximum Residential Scenario)		Proposed Project (Maximum Commercial Scenario)	
			Population	Increase	Population	Increase
Existing Recreational Facilities						
Potrero Hill Recreation Center	9.50	12,730	19,598	54%	16,465	29%
Existing Parks						
Esprit Park	1.80	7,465	14,333	92%	11,200	50%
Warm Water Cove	1.85	1,097	7,965	626%	4,832	340%
Woods Yard Park	0.25	2,367	9,235	290%	6,102	158%
Potrero Hill Mini Park[c]	0.30	12,730	19,598	54%	16,465	29%
Agua Vista Park[d]	0.50	4,795	11,663	143%	8,530	78%
Bayfront Park[d]	2.01	4,795	11,663	143%	8,530	78%
Connecticut and Arkansas Friendship Gardens[c]	0.25	12,730	19,598	54%	16,465	29%
Total[e] 16.46 acres						
Additional Baseline Parks						
Mariposa Park	2.38	7,447	14,315	92%	11,182	50%
Bayfront Park	7.11	4,795	11,663	143%	8,530	78%
800 Indiana Street project	0.10	8,431	15,299	81%	12,166	44%
650 Indiana Street project	0.20	7,947	14,815	86%	11,682	47%
20th Street Historic Core project	1.00	2,028	8,896	339%	5,763	184%
Total 10.79 acres						

Notes:

[a] The total residential population, the service population, of each area is based upon 2010 U.S. Census data of all census block groups in or partially within a 0.5-mile radius of each park or recreation facility.

[b] These parks and recreation facilities are located within the following Census Tracts: 226, 227.02, 607, 614, and 9809. Based on the 2013 ACS, the annual growth rate of these census tracts between 2010 and 2013 was, on average, 1.14 percent annually. To be conservative, a 1.5 percent growth factor is used to estimate the 2013 Service Population.

[c] The Potrero Hill Recreation Center, Potrero Hill Mini Park, and Connecticut and Arkansas Friendship Gardens are adjacent to each other and considered to serve same population.

[d] Agua Vista Park and Bayfront Park are adjacent to one another and considered to serve the same population.

[e] This total does not include the 1-acre Progress Park or the 1-acre Pennsylvania Street Gardens because they are not owned or operated by the City.

Source: San Francisco Recreation and Parks Department

Implementation of the Proposed Project under both the Maximum Residential Scenario and the Maximum Commercial Scenario would increase demand for parks and recreational facilities in the local area. Impacts unique to either the Maximum Residential Scenario or the Maximum Commercial Scenario are discussed further below.

Maximum Residential Scenario

Under the Maximum Residential Scenario, proposed uses would generate up to 6,868 residents (4,881 residents on the 28-Acre Site and 1,987 residents on the Illinois Parcels) where none existed previously and would increase on-site employment by approximately 5,599 persons (approximately 5,443 employees at the 28-Acre Site and 156 employees at the Illinois Parcels). Unlike office worker populations, residents are more likely to use recreational facilities on weekends as well as weekdays. The new residential population at the project site combined with the increase in on-site employment could increase the demand for and use of existing neighborhood parks and recreational facilities near the project site as well as City- and region-serving parks and recreational facilities.

With implementation of the Maximum Residential Scenario, the population of the area within a 0.5-mile radius of the project site would increase from 5,404 residents to 12,272 residents.[43] The Proposed Project would also add 9 acres of new open space. In isolation, the Proposed Project would provide a ratio of approximately 1.3 acres of its own open space per 1,000 on-site residents (9 acres per 6,868 residents). The local neighborhood ratio of existing open space to residents is approximately 3.1 acres per 1,000 residents. Upon completion of planning and construction, the additional baseline projects (Mariposa Park; additional Bayfront Park development at P22, P23, and P24; 650 Indiana Street; 800 Indiana Street; and the 20th Street Historic Core projects) would increase this ratio to approximately 5.0 acres per 1,000 residents. Increases to the local population and open space system as a result of the Proposed Project would change the local ratio of total open space to residents to approximately 3.0 acres of open space per 1,000 residents. Based on these assumptions, the Maximum Residential Scenario of the Proposed Project would increase the overall acreage of open space by approximately 33 percent, but decrease the ratio of acres of open space per 1,000 residents by approximately 40 percent.

The decrease in the ratio of open space to 1,000 residents that would result with implementation of the Proposed Project has the potential to accelerate the existing rate of deterioration at nearby parks and recreational facilities. Of the eight existing parks and recreational facilities within a 0.5-mile radius of the project site, one facility, the Potrero Hill Recreation Center, was identified

[43] As estimated from the 1.5 percent increase in Citywide population from 2010 to 2013, as described in "Existing Recreation Demand," p. 4.J.11.

in the 2012 Clean and Safe Parks Bond as needing improvements to the natural turf playfields and the dog play area.[44] These improvements are anticipated to take place in 2017 and the affected recreation facilities are scheduled to re-open to the public by July 2018.[45]

As discussed above under "Existing Recreation Demand," p. 4.J.14, the most recent park evaluation scores indicate that the Potrero Hill Recreation Center is a well-maintained park (91 percent). As of the latest quarterly evaluation conducted by RPD and the Office of the Controller (April 1 to June 30, 2014), two evaluations took place, on May 15, 2014, and May 27, 2014. In general, most feature elements were found to be in satisfactory condition and no feature elements scored less than 80 percent in evaluations performed to date. Feature elements identified as requiring further improvement included a dog waste bag dispenser and a hole in a dog play area, overgrown pathways, holes in fences and broken gate latches, a dirty restroom, peeling paint, and graffiti and trash.[46] Construction under the Maximum Residential Scenario would not begin until 2018 and would not be fully complete until 2029. As such, it is anticipated that identified improvements to the Potrero Hill Recreation Center would be completed by the time the first occupancy permit for the Proposed Project would be issued.

Other RPD parks within the 0.5-mile radius of the project site include Esprit Park and Woods Yard Park. As discussed above under "Existing Recreation Demand," p. 4.J.14, the most recent park evaluation scores indicate that Esprit Park is a well-maintained park (92.7 percent), and, as of the latest quarterly evaluation conducted by RPD and the Office of the Controller (April 1 to June 30, 2014), the natural turf area was inspected twice (April 22, 2014 and May 31, 2014) and received park evaluation scores of 100 percent and 85.71 percent.[47] Woods Yard Park has not been evaluated by RPD. Nonetheless, turf landscaping and playground amenities such as those found at Woods Yard Park are among the types of features most susceptible to deterioration.

Bay Front Park, Agua Vista Park, and Warm Water Cove, managed by the Port, feature pedestrian and bicycle paths and picnic or seating areas, each of which are hardscape features that are relatively resilient to use and deterioration. The Connecticut and Arkansas Friendship

[44] San Francisco Recreation and Parks Department, Active Capital Projects, 2015. Available online at http://sfrecpark.org/park-improvements/currentprojects/. Accessed September 22, 2015.

[45] San Francisco Recreation and Parks Department, Potrero Hill Recreation Center: Field Improvements, Community Meeting (3) Presentation, June 16, 2016. Available online: http://sfrecpark.org/wp-content/uploads/Community-Meeting-3-Presentation.pdf. Accessed October 24, 2016.

[46] San Francisco Recreation and Parks Department, San Francisco Park Maintenance Standards: Park Evaluation Report *(Reporting period from Apr 1, 2014 to Jun 30, 2014)*, July 28, 2014, pp. 623-632. Available online at http://sfrecpark.org/wp-content/uploads/FY14-Q4-5.-Individual-Park-Evaluation.pdf. Accessed December 8, 2015.

[47] San Francisco Recreation and Parks Department, San Francisco Park Maintenance Standards: Park Evaluation Report *(Reporting period from Apr 1, 2014 to Jun 30, 2014)*, July 28, 2014, pp. 161-164. Available online at http://sfrecpark.org/wp-content/uploads/FY14-Q4-5.-Individual-Park-Evaluation.pdf. Accessed December 8, 2015.

Gardens, managed under the Urban Agricultural Program, do not include amenities for active play or sports, and would not be considered facilities sensitive to deterioration from overuse or high demand.

The additional baseline parks (Mariposa Park; additional Bayfront Park development at P22, P23, and P24; 650 Indiana Street; 800 Indiana Street; and the 20th Street Historic Core projects) have not yet been developed and, as such, they have not yet undergone use or evaluation. Mariposa Park and the additional Bayfront Park development areas would each feature softscapes in the form of lawn areas or play structures. The 650 Indiana Street, 850 Indiana Street, and 20th Street Historic Core projects would each provide public plazas, which typically have hardscape features such as stone ground cover, benches, and seating areas that are relatively resilient to use and deterioration.

An increase in demand for parks and recreational facilities occurs when a facility is sought out by a substantial number of new residents. Parks and recreation facilities are most attractive for users if they provide both desirable services and are physically accessible. Accessibility is a factor of location and walking distance; a user is most likely to frequent a park if it is the closest park to his or her residence or work site. However, the park and recreation facility must also provide desirable features to the user, whether for leisure, sports and athletics, or quiet space, and a user may seek out a more distant park and recreational facility if it provides desired specialized facilities, such as sports fields or playgrounds. As a result, certain park and recreation facilities may be inaccessible to a user or unneeded by the population and therefore underutilized, whereas other facilities may be easily accessible or highly desired and therefore overutilized. However, a specific lack of capacity for any individual type of recreational activity in and of itself would not be considered a significant adverse impact. For example, a lack of accessible tennis courts in a project area would not itself cause a significant impact.

An increase in population, and therefore an increase in park users, is expected as a result of the Proposed Project; however, such an increase is not the single factor that leads to increased deterioration or physical degradation of recreation resources. Other factors contributing to physical degradation of recreation resources may include park design, age of infrastructure, how the park is used, and level of maintenance.

As stated on p. 4.J.29, the Proposed Project includes the construction of 9 acres of open space in an area that is generally lacking in open space compared to other areas of the City. As discussed above under “Project Features,” pp. 4.J.28-4.J.29, the proposed open space program would include a variety of different active and passive recreational options, including a playground; seating areas; gardens; a waterfront pedestrian and bicycle promenade that would extend the Blue Greenway and Bay trails through the project site; and potential rooftop facilities such as sports courts, play fields, urban agriculture plots, seating, or observational terrace areas. These

proposed facilities, especially the playground, lawn area, and potential rooftop sports courts,[48] would offset demand on other facilities in the project area such as the Potrero Hill Recreation Center, Esprit Park, Woods Yard Park, and others that could otherwise experience deterioration. Overall, existing and future residents would have more opportunities to engage in recreational activity in their neighborhood with the range of open spaces that would be developed as part of the Proposed Project.

Based on accessibility, future residents would most likely choose to use nearby on-site facilities provided as part of the Proposed Project instead of other, more distant parks and recreational facilities. Furthermore, local residents who use existing and additional baseline parks and recreational facilities may choose to visit the new facilities that would be provided with the Proposed Project, which could alleviate the rate of deterioration at the existing and additional baseline parks and recreational facilities within a 0.5-mile radius of the project site.

The Maximum Residential Scenario would create 9 acres of new open space and add 6,868 new residents to the area, for a total new service population of approximately 12,272 residents. Comparably, the existing 9.5-acre Potrero Hill Recreation Center also serves a population of approximately 12,000 residents as of 2010. Potrero Hill Recreation Center was found to be well maintained per quarterly RPD evaluation. This comparison suggests that the amount of open space provided by the Proposed Project is reasonable to support the resulting new population (9 acres for 12,272 residents).

In addition to the 9 acres of open space, the Proposed Project would be required to provide usable open space areas for future residential building occupants. The new Pier 70 Special Use District (SUD) would require residences to provide usable open space in the amount of 40 gsf per dwelling unit. Usable open space could be provided in the form of common courtyards, terraces, and private balconies. The availability and use of this open space would further reduce the overall demand on nearby public parks and recreational resources from future residents as a result of the Proposed Project.

In sum, implementation of the Proposed Project under the Maximum Residential Scenario would result in an incremental increase in the demand for recreational resources on the project site, in the project area, and at the Citywide level; however, the anticipated use of recreational resources would not be expected to substantially increase or accelerate the physical deterioration or degradation of existing recreational resources. Given the proposed development of recreational facilities and open space on the project site and the existing parks and recreational facilities in the

[48] Potential rooftop sports courts are an optional component and are not calculated in the 9 acres of open space the Proposed Project provides. In the event that rooftop sports courts are not constructed, recreational users would continue to rely on nearby sports facilities such as indoor courts at Potrero Hill Recreation Center.

project area, the anticipated on-site population would not increase the use of existing public facilities such that significant physical deterioration on public parks or recreational facilities would occur. No additional new facilities would need to be constructed, and no mitigation is necessary.

Maximum Commercial Scenario

Implementation of the Proposed Project under the Maximum Commercial Scenario would increase demand for parks and recreational facilities. Proposed uses would generate up to 3,735 residents where none existed previously and would increase on-site employment by approximately 9,768 persons.[49] Unlike office worker populations, residents are more likely to use recreational facilities on weekends as well as weekdays. For the purposes of this analysis, the following discussion focuses on the new residential population at the project site under the Maximum Commercial Scenario.

With implementation of the Maximum Commercial Scenario, the population of the area within a 0.5-mile radius of the project site would increase from 5,404 residents to about 9,139 residents.[50] Increases to the local population and the amount of park and open space resources would result in a change to the existing local ratio of open space to residents of approximately 3.1 acres per 1,000 residents (5.0 acres upon completion of additional baseline projects) to approximately 4.0 acres of open space per 1,000 residents. Similar to the Maximum Residential Scenario, the Maximum Commercial Scenario of the Proposed Project would increase the overall acreage of parks and recreation facilities, but decrease the local ratio of total open space to residents by approximately 20 percent.

Of the eight parks and recreational facilities within a 0.5-mile radius of the project site, one facility, the Potrero Hill Recreation Center, was identified in the 2012 Clean and Safe Parks Bond as needing improvements to the natural turf playfields and the dog play area.[51] As shown in Table 4.J.5 on p. 4.J.33, implementation of the Maximum Commercial Scenario would add about 3,735 residents to the project site, bringing the total number of persons within the Potrero Hill Recreation Center's service area up to 16,465 persons, or an increase of 29 percent from 2013. This increase would be less than that with the Maximum Residential Scenario.

[49] See Section 4.C, Population and Housing, for assumptions about the number of new residents and workers in San Francisco and the total number of residents and workers that would result from the Proposed Project.

[50] As estimated from the 1.5 percent increase in Citywide population from 2010 to 2013, as described in "Existing Recreation Demand," p. 4.J.11.

[51] San Francisco Recreation and Parks Department, Active Capital Projects, 2015. Available online at http://sfrecpark.org/park-improvements/currentprojects/. Accessed September 22, 2015.

Other parks within the 0.5-mile radius of the project site that feature turf areas and playgrounds include Esprit Park and Woods Yard Park. As discussed above, Esprit Park is a well-maintained park (92.7 percent).[52] The 2013 service area population for these parks was approximately 7,465 persons and 2,367 persons, respectively. As with the Potrero Hill Recreation Center, the Maximum Commercial Scenario would increase the potential number of persons within these parks' service area by 3,735 persons. Therefore, the service area population for Esprit Park and Woods Yard Park would increase to 11,200 persons and 6,102 persons, respectively, an increase of approximately 50 percent and 158 percent, respectively, from 2013. This increase would be less than that with the Maximum Residential Scenario.

Similar to the Maximum Residential Scenario, the Maximum Commercial Scenario includes the construction of 9 acres of open space in an area that is generally lacking in open space compared to other areas of the City. Overall, existing and future residents would have more opportunities to engage in recreational activity in their neighborhood with the range of parks and open spaces that would be developed as part of the Proposed Project.

Based on accessibility, future residents would most likely choose to use nearby on-site facilities provided as part of the Proposed Project instead of other, more distant, parks and recreational facilities. Furthermore, local residents who use existing parks and recreational facilities may choose to visit the new facilities that would be provided with the Proposed Project, which could alleviate the rate of deterioration at the eight existing parks and recreational facilities within a 0.5-mile radius of the project site.

The Proposed Project under the Maximum Commercial Scenario would create 9 acres of new open space and add 3,735 new residents to the area, for a total new service population of approximately 9,139 residents. Comparably, the existing 9-acre Potrero Hill Recreation Center serves an even greater population of approximately 12,000 residents as of 2010. Potrero Hill Recreation Center was found to be well maintained per the quarterly RPD evaluation. This comparison suggests that the amount of open space provided by the Proposed Project is reasonable to support the resulting new population (9 acres for 9,139 residents).

In addition to the 9 acres of open space, the Proposed Project would be required to provide usable open space areas for future residential building occupants. The SUD would require residences to provide usable open space in the amount of 40 gsf per dwelling unit. Usable open space could be provided in the form of common courtyards, terraces, and private balconies. The availability and

[52] San Francisco Recreation and Parks Department, San Francisco Park Maintenance Standards: Park Evaluation Report *(Reporting period from Apr 1, 2014 to Jun 30, 2014)*, July 28, 2014, pp. 161-164. Available online at http://sfrecpark.org/wp-content/uploads/FY14-Q4-5.-Individual-Park-Evaluation.pdf. Accessed December 8, 2015.

use of this open space would further reduce the overall demand on nearby public parks and recreational resources from future residents as a result of the Proposed Project.

Therefore, implementation of the Proposed Project under the Maximum Commercial Scenario would result in an incremental increase in the demand for recreational resources on the project site, in the project area, and at the Citywide level. This anticipated increase in the use of recreational resources would not substantially increase or accelerate physical deterioration or degradation. Given the proposed development of recreational facilities and open space on the project site, and the existing parks and recreational facilities within 0.5 mile of the project area, the population increase resulting from the Proposed Project would not increase the use of existing public facilities such that substantial physical deterioration on public parks or recreational facilities would occur. No additional new facilities would need to be constructed, and no mitigation is necessary.

Impact RE-2: Construction of the parks and recreational facilities proposed as part of the Proposed Project would not result in substantial adverse physical environmental impacts beyond those analyzed and disclosed in this EIR. ***(Less than Significant)***

The Proposed Project, under both the Maximum Residential Scenario and the Maximum Commercial Scenario, would include the development of 9 acres of new parks and recreational facilities. Construction activities for the parks and recreational facilities would vary depending on the location and type of work. Some existing structures on the project site would be demolished; however, the project site does not contain existing parks or recreational facilities. Generally, for the construction of new parks and recreational facilities, sites would be cleared and graded and the following elements would be installed: utilities (e.g., electrical, water, sanitary sewer, and storm drainage), hardscape (e.g., concrete, asphalt, stone, walls, sport-court and play area surfacing, decking/boardwalks), softscape (e.g., lawns, trees, landscaping, and associated irrigation infrastructure), new site structures (e.g., restrooms, picnic/shade shelters, kiosks, pavilions, overlooks, piers), and site furnishings (e.g., benches, picnic tables, drinking fountains, play equipment, fencing, artwork, lighting). Open space would generally require minimal construction activities, mainly for construction of trails and other hardscapes, installation of irrigation infrastructure, and landscaping. To address the potential hazard of liquefaction and lateral spreading that may occur during a major earthquake, the Proposed Project would likely include construction of below-grade secant pile walls along the northeastern and southeastern portions of the project site (north and south of the slipway structures). (See “Geotechnical Stabilization” in Chapter 2, Project Description, p. 2.69, and Section 4.N, Geology and Soils, pp. 4.N.25-4.N.26, for further discussion of the seismic improvements.)

Construction of parks and recreational facilities as a component of the Proposed Project would be phased over an anticipated 11-year construction period, and construction-related impacts in any single location would be temporary. As shown on Figure 2.26, Proposed Phasing Plan – Maximum Residential Scenario, p. 2.82, and Figure 2.27, Proposed Phasing Plan – Maximum Commercial Scenario, p. 2.85, park facilities would generally be constructed within the same construction phase as adjacent parcels over the five construction phases. Construction activities during this period could affect nearby residents, workers, and public open spaces. The 20th Street Historic Core, an additional baseline project currently under construction, will be located adjacent to the proposed project site and will be in operation by the time construction of the Proposed Project begins. Project-related impacts related to the construction of the various park and recreation facilities are summarized below. (See Section 4.E, Transportation and Circulation; Section 4.F, Noise; Section 4.G, Air Quality; and Section 4.P, Hazards and Hazardous Materials, for detailed discussions.)

Construction of parks and recreational facilities as a component of the Proposed Project, could result in impacts on the transportation and circulatory network. As discussed in Section 4.E, pp. 4.E.76-4.E.78, construction-related transportation impacts of the Proposed Project would be less than significant, and no mitigation measures required. However, Improvement Measure I-TR-A: Construction Management Plan, pp. 4.E.77-4.E.78, would further reduce less-than-significant impacts regarding potential conflicts between construction activities and pedestrians, bicyclists, transit and vehicles, and between construction activities and nearby businesses and residents.

As described in Section 4.F, Noise and Vibration, pp. 4.F.32-4.F.35, construction of the Proposed Project, including construction of the various park and recreation facilities, would result in temporary noise increases in excess of standards in the Noise Ordinance (Article 29 of the Police Code). Mitigation Measure M-NO-1: Construction Noise Control Plan, pp. 4.F.33-4.F.35, would reduce this noise impact to a less-than-significant level. Construction of the Proposed Project could cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the Proposed Project, and could expose people and structures to or generate excessive groundborne vibration levels. Mitigation Measure M-NO-2: Noise Control Measures During Pile Driving, and Mitigation Measure M-NO-3: Vibration Control Measures During Construction, pp. 4.F.40-4.F.41 and pp. 4.F.44-4.F.45, respectively, call for the use of quieter pile-driving equipment and techniques which cannot be assured to be feasible or substantially effective in attenuating noise impacts over an 11-year construction duration under all future circumstances; therefore, Impacts NO-2 and NO-3, discussed on pp. 4.F.36-4.F.45, are conservatively considered significant and unavoidable.

Construction of the Proposed Project, including construction of the various park and recreation facilities, would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Mitigation Measures M-AQ-1a through M-AQ-1h, as discussed in Section 4.G, Air Quality, on pp. 4.G.42-4.G.51, are proposed to minimize emissions. However, although implementation of Mitigation Measure M-AQ-1: Construction Emissions Minimization would substantially reduce construction-related emissions, the vast majority of emissions during construction of Phases 3, 4, and 5 would occur as a result of operational emissions; therefore, construction and operations-related emissions would remain significant during construction of Phases 3, 4, and 5 and at project build-out. Therefore, Impacts AQ-1 and AQ-2, discussed on pp. 4.G.30-4.G.62, would remain significant and unavoidable.

Demolition of buildings under the Proposed Project, including demolition to allow for development of the various park and recreational facilities, could potentially expose the public to hazardous building materials. This impact would be reduced to a less-than-significant level through implementation of Mitigation Measures M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers, M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed, and M-HZ-2c: Conduct Soil Sampling if Stained Soil Is Observed, as discussed in Section 4.P, Hazards and Hazardous Materials, pp. 4.P.55-4.P.60. Project development within the 28-Acre Site and Illinois Parcels would be conducted on a site included on a government list of hazardous materials sites and could encounter hazardous materials in the soil and groundwater; this could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Construction-related impacts associated with hazardous materials in the soil and groundwater would be reduced to a less-than-significant level through Mitigation Measures M-HZ-3a: Implement Construction and Maintenance-Related Measures of the Pier 70 Risk Management Plan, M-HZ-3b: Implement Well Protection Requirements of the Pier 70 Risk Management Plan, and M-HZ-4: Implement Construction-Related Measures of the Hoedown Yard Site Management Plan, pp. 4.P.61-4.P.62, p. 4.P.62, and p. 4.P.63, respectively.

In summary, the effects related to construction of the proposed parks and recreational facilities for the Proposed Project are addressed as part of the analysis of construction impacts for the Proposed Project as a whole. Mitigation measures are proposed to reduce significant environmental effects; however, there would be significant and unavoidable construction impacts related to Air Quality and Noise and Vibration. Construction of the Proposed Project's parks and recreational facilities would not result in additional significant impacts not otherwise disclosed elsewhere in this EIR; therefore, the physical environmental impacts as a result of construction of

parks and recreation facilities as part of the Proposed Project would be considered less than significant, and no additional mitigation beyond that identified elsewhere in this EIR is necessary.

Cumulative Impacts

Impact C-RE-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a cumulatively considerable contribution to significant cumulative impacts on recreation. ***(Less than Significant)***

The Proposed Project's potential contribution to cumulative impacts on recreation is evaluated in the context of past, present, and reasonably foreseeable future development expected in San Francisco and includes the additional baseline and cumulative projects and plans listed in Section 4.A, Introduction to Chapter 4, pp. 4.A.5-4.A.17. Cumulative projects that are relevant for a more localized cumulative analysis, such as the future Crane Cove Park or developments that propose the addition of public open space, are also discussed.

ABAG 2013 projections estimate an increase in San Francisco of 101,539 households (447,350 total households), 280,465 persons (1,085,700 total population), and 190,780 jobs (759,500 total jobs) from 2010 to 2040.[53] The project site is located within the Port of San Francisco Priority Development Area (PDA). A PDA is an infill location of at least 100 acres served by transit that is designated for compact land development, along with investments in community improvements and infrastructure. In 2040, the projected Citywide growth within all of San Francisco's PDAs is expected to account for approximately 62 percent of the anticipated number of households, 60 percent of the anticipated population growth, and approximately 83 percent of the anticipated number of jobs.[54] ABAG projections reflect local planning efforts such as the San Francisco Planning Department's Eastern Neighborhoods community planning and rezoning program that included the *Central Waterfront Area Plan* and the various waterfront land use planning efforts led by the Port. ABAG population and employment projections are, in turn, used by San Francisco to inform future needs and to facilitate the plans for the safe and equitable distribution of public services such as open space.

As discussed above, the project site is located along San Francisco's roughly 13-mile southern waterfront in an area that has been planned to accommodate a significant share of San Francisco's residential and employment growth while at the same time maintaining a diversity of employment-generating land uses such as production, distribution and repair uses. The transition of the southern waterfront area from industrial to mixed uses started in the 1990s with the transfer of Hunters Point Naval Shipyard from Federal to local control and the development of the San

[53] These calculations are based on ABAG *Projections* 2013, pp. 74-75.
[54] ABAG, *Projections 2013*, pp. 74-75.

Francisco Giants ballpark. The transition has continued with the redevelopment of Mission Bay (2000s to present), which includes the University of California San Francisco and the future Golden State Warriors Event Center and Mission Rock mixed-use projects, and the future redevelopment of the Candlestick Point/Hunters Point area at the southern end of the southern waterfront area. These long-term, multi-phased projects have contributed to, and will continue to contribute to, open space for current and future San Francisco residents at Mission Bay and at Candlestick Point/Hunters Point, which would provide up to 325 acres of open space.[55]

ABAG projections did not identify the project site as a location for future residential growth because Planning Department and Port land-use plans (which cover the Proposed Project's portion of Pier 70) identified the area for public access to the shoreline and to accommodate future employment growth.[56] Although not part of the overall consideration of residential growth in this area of San Francisco, the project site is located in an area where the development of mixed uses, including residential uses and open space, has been determined as an appropriate land use through passage of Proposition F by San Francisco voters (see the discussion under Regulatory Framework, pp. 4.J.16-4.J.26).

As discussed above under Impact RE-1, the Proposed Project would provide 9 acres of public open space to accommodate the anticipated demand for parks and recreational facilities. The Proposed Project would also provide usable open space for each residential dwelling unit, and, depending on future conditions, could also develop additional public open space (i.e., rooftop spaces) on Parcels C1 and C2, if developed as structured parking. Past, present, and reasonably foreseeable developments within a 0.5-mile radius of the project site would provide approximately 15.8 acres of public open space, as follows:[57]

- Future Crane Cove Park – Approximately 9 acres of waterfront mixed-purpose open space, including an urban beach, maritime fields, patio, open green, playgrounds, and slipway;
- Golden State Warriors Event Center and Mixed-Use Development Project – 3.2 acres of plazas, open space, and Bayfront overlook areas; and
- Potrero Hope SF Master Plan – 3.62 acres, which would include parks, terraces, pedestrian corridors, an edible garden, and open space, in addition to a 3,500-gsf community center.

[55] San Francisco Planning Department, ROSE, Map 4D and Map 6 on pp. 20-24.

[56] ABAG, Plan Bay Area PDA Showcase, Port of San Francisco, available online at http://gis.abag.ca.gov/website/PDAShowcase/; and Port of San Francisco, *Waterfront Land Use Plan*, available online at http://www.sfport.com/index.aspx?page=294. Accessed September 11, 2015.

[57] As discussed in Section 4.A, the Mission Bay Ferry Landing project would be constructed at the waterfront adjacent to Agua Vista Park and the Bay Trail. For the purposes of the recreation analysis, it is assumed that Agua Vista Park and the SF Bay Trail will remain unchanged, as design specifications for the ferry landing are undetermined.

Using a list-based approach (described in "Approach to Cumulative Impact Analysis," in Section 4.A, Introduction to Chapter 4, pp. 4.A.12-4.A.17), past, present, and reasonably foreseeable developments within 0.5 mile of the Proposed Project would also add 4,218 residential units, or an estimated 9,575 residents. Combined with a projected population of 6,868 residents on the project site under the Maximum Residential Scenario, there would be approximately 16,443 new residents. When combined with a projected population of 3,735 residents on the project site under the Maximum Commercial Scenario, there would be approximately 13,310 new residents. Past, present, and reasonably foreseeable developments with public open space within a 0.5-mile radius of the project site (approximately 15.82 acres) plus the Proposed Project (9 acres) would bring the total public open space in this geographic area from 27.25 to 52.07 acres, nearly doubling the amount of existing open space. This would represent a 91 percent increase in public open space over baseline conditions.

The cumulative open space demand generated by the Proposed Project's residential use and by past, present, and reasonably foreseeable development in the project vicinity would be met by public open spaces provided as part of the Proposed Project; existing City-owned public open spaces, including Esprit Park, Woods Yard Park, Warm Water Cove, Agua Vista Park, the Potrero Hill Recreation Center, and the Potrero Hill Mini Park; and planned City-owned public open spaces, including future Crane Cove Park, Bay Front Park, and the Blue Greenway and Bay Trail. The 2012 Clean and Safe Neighborhood Parks General Obligation Bond includes the development of the Power Plant Shoreline Access (on the Potrero Power Plant site) and the expansion of Warm Water Cove in addition to the future Crane Cove Park. Additional existing and planned public open space outside of the 0.5-mile radius (e.g., Mission Bay and Candlestick Point) would also be accessible to future residents, and would further distribute the demand for public open space generated by future residents. Although past, present, and reasonably foreseeable development would also increase the number of residents in the area, it is not anticipated that increased use, in combination with the provision of additional public spaces, would result in physical degradation of existing and planned open spaces.

The growth in San Francisco's open space system that has occurred as a result of the passage of the 2008 and 2012 Clean and Safe Neighborhood Parks General Obligation Bonds, which included a focus on the development of new open spaces in the eastern portions of San Francisco, reflects the City's efforts to continually assess and improve its open space system and to match recreation facilities and services provided to the population served. Development of new and upgraded open space acreage as a result of these bond measures has also led to improvements in the delivery of recreation programs, facilities, and services to a growing population. Furthermore, current planning efforts for the provision of open space, including the Open Space 2100 project, have been developed to provide a long-term roadmap for acquiring, developing, funding, and managing open space in consideration of San Francisco's open space needs over the

next 100 years and projected population growth including the growth resulting from past, present, and future development projects. [58]

The increase in residents as a result of the Proposed Project and past, present, and reasonably foreseeable development would not be beyond levels anticipated and planned for by the City for this area and at the Citywide level. When the resultant demand is considered in the context of existing public open space in the area and at the Citywide level, proposed open space that would be developed as part of the Proposed Project, and the anticipated additions to San Francisco's open space system, the demand generated by the Proposed Project and past, present, and reasonably foreseeable developments would be expected to be accommodated. For these reasons, the Proposed Project's contribution to cumulative impacts on recreation at the local and Citywide level would not be cumulatively considerable and would not substantially accelerate physical deterioration of recreational resources. Therefore, the Proposed Project would not contribute to any significant cumulative impacts on recreation. No mitigation is necessary.

[58] Open Space San Francisco: 2100. Available online at http://www.openspacesf.org/about. Accessed June 2, 2016.

K. UTILITIES AND SERVICE SYSTEMS

Section 4.K, Utilities and Service Systems, addresses the potential effects of the Proposed Project on existing public utilities and service systems, including water supply, wastewater and stormwater, and solid waste collection and disposal. The Environmental Setting describes existing service providers, infrastructure, and system capacities. The Impacts and Mitigation Measures discussion addresses the changes in demand for utilities and service systems that would occur if the Proposed Project is implemented, and whether new or expanded services or infrastructure would be needed as a result. The Impacts discussion also considers whether the Proposed Project in combination with other reasonably foreseeable development projects would contribute to cumulative environmental impacts related to utilities and service systems.

The Proposed Project's potential impacts on water quality, including impacts on water quality from combined sewer overflows, are addressed in Section 4.O, Hydrology and Water Quality.

In the sections that follow, the discussions regarding the existing and future water supply and water demands in San Francisco are based on a number of sources. Information regarding the available water supply for the Proposed Project is based on both San Francisco's *2010 Urban Water Management Plan* (UWMP)[1] and the *2013 Water Availability Study*.[2] The UWMP presents projected water supplies while the *2013 Water Availability Study* provides updated water demands based on newer population growth projections for San Francisco. This information is supplemented with newer information that is publicly available on the San Francisco Public Utilities Commission's (SFPUC) web site to update the status of obtaining additional future groundwater and recycled water supplies. The SFPUC's *Fiscal Year 2014-15 Annual report* provides information regarding historic water use in San Francisco through Fiscal Year 2014-15.[3] Information available on the SFPUC and San Francisco Fire Department (SFFD) web sites provide a description of San Francisco's emergency firefighting system, referred to as the Auxiliary Water Supply System (AWSS).

Information regarding the capacity of the combined sewer system was obtained from the Regional Water Quality Control Board National Pollutant Discharge Elimination System (NPDES) permit for discharges from the Southeast Water Pollution Control Plant (SEWPCP), the North Point Wet Weather Facility, and all of the Bayside wet-weather facilities, including

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1 San Francisco Public Utilities Commission (SFPUC), *2010 Urban Water Management Plan for the City and County of San Francisco*, June 2011 (hereinafter referred to as "*2010 UWMP*).

2 SFPUC, *2013 Water Availability Study for the City and County of San Francisco,* May 2013 (hereinafter referred to as "*2013 Water Availability Study*").

3 SFPUC, Water Resources Division, *Annual Report, Fiscal Year 2014-15* (hereinafter referred to as "*FY 2014-15 Annual Report*"), p. 6.

combined sewer discharges (CSDs) to San Francisco Bay (referred to as the Bayside NPDES Permit, and discussed in Regulatory Framework in Section 4.O, Hydrology and Water Quality, pp. 4.O.29-4.O.30).[4] Various SFPUC engineering reports also supplement this information. Information on existing utilities at the project site and the Proposed Project's projected water usage and wastewater generation is based on engineering documents provided by the project sponsors.

ENVIRONMENTAL SETTING

WATER SUPPLY AND DEMAND

This subsection describes the available water supply in San Francisco and existing and projected water demands. In this context, the water supply includes all of the potable and recycled water sources discussed below. "Water demand" refers to the historic and projected amount of water used in San Francisco for all purposes, including municipal, industrial, commercial, and residential uses. The term "potable water" refers to water that is suitable for drinking and use in cooking. The term "recycled water" refers to wastewater that has been treated to remove solids and impurities and disinfected. Recycled water is not a potable water source and cannot be used as drinking water; however, it can be used for non-potable purposes (e.g., toilet and urinal flushing, landscape irrigation, and providing cooling to buildings), which reduces the demand for potable water.

Water Supply

The SFPUC's 2010 UWMP describes San Francisco's long-term strategy for ensuring that adequate water supplies are available to meet existing and future water demand over the 20-year planning horizon between 2015 and 2035.[5] The UWMP evaluates water deliveries and uses, water supply sources, efficient water uses, demand management measures, and water shortage contingency planning. In accordance with the Water Conservation Act of 2009, the SFPUC must also provide annual reports on their status of achieving the 20 percent reduction in water use mandated by the Act in its UWMP.

The UWMP was prepared in accordance with the requirements of the California Urban Water Management Planning Act (described Regulatory Framework, pp. 4.K.15) and considered growth in San Francisco based on estimates in the San Francisco Planning Department's 2009 Land Use

[4] San Francisco Bay Regional Water Quality Control Board (RWQCB), *Order No. R2-2013-0029, NPDES No. CA0037664, City and County of San Francisco, Southeast Water Pollution Control Plant, Northpoint Wet Weather Facility, Bayside Wet Weather Facilities, and Wastewater Collection System*. Adopted August 14, 2013 (hereinafter referred to as "*Bayside NPDES Permit*").

[5] SFPUC, *2010 UWMP*.

Allocation. In summer 2012, the Planning Department updated the Land Use Allocation and estimated that there will be 11,235 more dwelling units and 35,068 more jobs in 2035 than were estimated in the 2009 Land Use Allocation projections. The SFPUC subsequently prepared an updated water availability study in 2013 that considers the updated growth estimates.[6] The water supply analysis presented in this subsection relies on the *2013 Water Availability Study*.

Although San Francisco's updated 2015 UWMP was submitted to the Department of Water Resources by July 1, 2016 as required, the discussion below focuses on the 2010 UWMP and associated 2013 Water Availability Study because the 2010 UWMP was in effect when the Notice of Preparation for the Proposed Project was published. The 2015 UWMP does not include any substantial changes that would affect the availability of potable water for the Proposed Project.

Existing and Planned Future Water Supply

The SFPUC's regional water system serves approximately 2.6 million people in San Francisco, Santa Clara, Alameda, San Mateo, and Tuolumne counties, including all of the City and County of San Francisco. About 85 percent of the water delivered to SFPUC customers comes from Tuolumne River water stored in Hetch Hetchy Reservoir in the Sierra Nevada, and the remaining 15 percent comes from local sources. These local sources include runoff in the Alameda and Peninsula watersheds that is captured in reservoirs located in San Mateo, Alameda, and Santa Clara counties, as supplemented by local groundwater and recycled water. The regional water system conveys Tuolumne River water to the Bay Area and blends it with local sources before supplying its customers with approximately 265 million gallons of potable water per day (mgd).[7] The regional water system provides potable water to both wholesale customers located outside of San Francisco and retail customers via over 280 miles of pipelines, over 60 miles of tunnels, 11 reservoirs, 5 pump stations, and 2 water treatment plants outside of the San Francisco.[8]

The regional water system provides water to 27 wholesale customers in San Mateo, Alameda, and Santa Clara counties. Under the 2009 Water Supply Agreement among the SFPUC and wholesale customers, wholesale customers are assured 184 mgd of the regional water supply through 2018 during normal hydrologic years.[9] This represents approximately two-thirds of the total regional supply of 265 mgd.

The SFPUC also maintains a retail water system to distribute water within San Francisco, as well as to some suburban retail customers that are located outside the City, including the Town of

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6 SFPUC, *2013 Water Availability Study.*
7 SFPUC, *2013 Water Availability Study*, p. 2.
8 SFPUC, *2010 UWMP*, p. 7.
9 SFPUC, *2013 Water Availability Study*, p. 5.

Sunol, San Francisco International Airport, Lawrence Livermore National Laboratory, the Castlewood community in the City of Pleasanton, and Groveland Community Services District. These users are referred to as retail customers and include primarily municipal, industrial, commercial, and residential users. The discussion below focuses on the SFPUC's retail water system and water supply because potable water for the Proposed Project would be obtained from this supply.

In 2008, the SFPUC adopted the Water System Improvement Program (WSIP), a multi-billion-dollar capital program to improve and enhance the regional water system's water quality, seismic reliability, delivery reliability, and water supply. The SFPUC has implemented approximately 90 percent of the WSIP projects, [10] which include local water supply projects aimed at providing additional water supply sources to meet the future water needs of SFPUC retail customers during years with normal rainfall as well as during droughts. The WSIP water supply objectives for drought years are based on regional water system supplies forecasted for a conservative "design drought" of 8.5 years.[11]

Normal Year Retail Water Supplies

Retail customers within and outside of San Francisco are assured 81 mgd of supply from the regional water system through 2018 during years with normal amounts of rainfall, or about one-third of the regional water supply.[12] The SFPUC supplements the regional water system supplies with a small portion of local groundwater and recycled water to meet the full retail demand. In 2015, the available supply for all retail customers, including users within San Francisco and suburban customers, was 83.5 mgd.[13]

The SFPUC plans to augment local supplies for its retail customers by extracting up to 4 mgd of groundwater from new wells in the Westside Groundwater Basin, located on the west side of the City. This project, referred to as the San Francisco Groundwater Supply Project, is anticipated to provide an additional 2.8 mgd of potable water supply by early 2017, with the remaining 1.2 mgd to be implemented in a subsequent phase.[14] In addition, the SFPUC's planned Westside and Eastside Recycled Water projects would provide an estimated 4 mgd of recycled water, which would be used primarily for landscape irrigation, toilet flushing and industrial uses that do not require potable water. Implementation of these recycled water projects would therefore increase

[10] SFPUC, *WSIP Overview*. Available online at http://sfwater.org/index.aspx?page=115. Accessed December 29, 2015.
[11] SFPUC, *2010 UWMP*, p. 50-51.
[12] SFPUC, *2010 UWMP*, p. 24.
[13] SFPUC, *2013 Water Availability Study*, p. 13.
[14] SFPUC, *San Francisco Groundwater Supply*. Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=322. Accessed December 29, 2015.

the availability of potable water for retail customers. The Westside Recycled Water Project has an expected completion date of March 2019,[15] and the Eastside Recycled Water Project is in the planning stages, with construction not expected to start until January 2026.[16] With implementation of these projects, the total available regional retail supply of potable water is anticipated to increase from 83.5 to 90.3 mgd by 2030 during normal hydrologic years.[17]

Dry Year Retail Water Supplies

The water supply estimates discussed above are based on typical years with normal (i.e., average or above average) precipitation. These are referred to as "normal years." However, in any given year, the amount of water available to the SFPUC is constrained by hydrologic conditions affecting the amount of rainfall, existing physical facilities to convey the water, and institutional parameters that govern the amount of water available from the Tuolumne River. Due to these constraints, the SFPUC is more dependent on local reservoir storage during dry years to maximize the reliability of its water supplies, because local reservoirs store water from wet years.[18] Local water supply sources, including local groundwater and recycled water, are critical supplementary water sources during dry years.

During a prolonged drought, the water supplies from the regional water system are curtailed. The SFPUC has adopted a *Water Shortage Allocation Plan* that outlines procedures for adjusting the available water supply and allocating water from the regional system among its retail and wholesale customers when shortages would be less than 20 percent. As summarized in Table 4.K.1: Existing and Planned Future SFPUC Retail Water Supplies, the retail water supply would not be reduced during a single dry year, but it would be reduced in subsequent years of a prolonged drought.

Table 4.K.1: Existing and Planned Future SFPUC Retail Water Supplies (mgd)

Hydrologic Year Type	2015	2035
Normal Year	83.5	90.3
Single Dry Year	83.5	90.3
Years 2 and 3 of Multiple Dry Years	82.0	88.8

Source: SFPUC, *2013 Water Availability Study*, p. 13

[15] SFPUC, *San Francisco Westside Recycled Water Project*, Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=310. Accessed December 29, 2015.
[16] SFPUC, *San Francisco Eastside Recycled Water Project*, Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=311. Accessed December 29, 2015.
[17] SFPUC, *2013 Water Availability Study*, p. 13.
[18] SFPUC, *2010 UWMP*, p. 54.

Comparison of Retail Water Demand and Water Supply

The *2013 Water Availability Study* determined that the SFPUC could meet the future demands of its retail customers in normal years, single dry years, and dry year events that last longer than 1 year. As summarized in Table 4.K.2: Projected SFPUC Retail Water Demands – Normal and Single Dry Year, the study determined that in a normal year, the total retail demand for potable water would be 83.7 mgd in 2015 and 84.2 mgd by 2035.[19] This would result in a projected retail potable water shortage of 0.2 mgd in 2015 and a projected retail potable water surplus of 6.1 mgd in 2035. The study projected that the 2015 shortage would have occurred prior to full implementation of new local supplies under the WSIP, including groundwater and recycled water. The shortage represents less than a 0.25 percent shortfall, which the study concludes could be managed through voluntary conservation measures or, if necessary, rationing.

Table 4.K.2: Projected SFPUC Retail Water Demands – Normal and Single Dry Year (mgd)

Retail Customer	2015	2035
In-City (in San Francisco)	78.1	78.6
Suburban (outside San Francisco)	5.6	5.6
Total Retail Demand	**83.7**	**84.2**
Normal Year and Single Dry Year Water Supply	83.5	90.3
Projected Surplus (Shortage)	(0.2)	6.1

Note: As discussed in the text that follows, the projected shortfall in 2015 did not occur because retail water demands were less than projected in the *2013 Water Availability Study*.

Source: SFPUC, *2013 Water Availability Study*, pp. 17 and 20

As noted above, the SFPUC is required to curtail the retail water supply in accordance with the *Water Shortage Allocation Plan* in the event of a multi-year drought. This curtailment was projected to reduce total retail potable water supplies to 82.0 mgd in 2015 and 88.8 mgd in 2035. As summarized in Table 4.K.3: Projected SFPUC Retail Water Demand – Multiple Dry Year, this would result in a projected retail potable water shortage of 1.7 mgd in 2015 and 4.6 mgd retail potable water surplus in 2035. The projected shortage in 2015 represents less than a 2 percent shortfall, which the UWMP concludes could also be managed through voluntary conservation measures or, if necessary, rationing.

[19] SFPUC, *2013 Water Availability Study*, p. 17.

Table 4.K.3: Projected SFPUC Retail Water Demand – Multiple Dry Year (mgd)

Retail Customer	2015	2035
In-City (in San Francisco)	78.1	78.6
Suburban (outside San Francisco)	5.6	5.6
Total Retail Demand	**83.7**	**84.2**
Multiple Dry Year Water Supply	82.0	88.8
Projected Surplus (Shortage)	(1.7)	4.6

Note: As discussed in the text that follows, the projected shortfall in 2015 did not occur because retail water demands were less than projected in the *2013 Water Availability Study*.

Source: SFPUC, *2013 Water Availability Study*, pp. 17 and 20

Note that the shortfall anticipated in 2015 did not occur, despite the multi-year drought, because, based on the SFPUC's *Fiscal Year 2014-15 Annual Report*, the total retail water use in 2015 was 69 mgd, or 13 mgd less than the projected in-City retail water demand identified in the *2013 Water Availability Study*.[20]

Water Conservation in San Francisco

Despite population growth, San Francisco's total water demand has consistently lessened over the last 15 years, largely due to comprehensive water conservation efforts and public education programs implemented by the City. San Francisco's gross per capita retail water use (including water use for all categories, including commercial, industrial, municipal, and residential) has decreased from 102 gallons per day in Fiscal Year 2005-06 to 77 gallons per day in Fiscal Year 2014-15, a reduction of almost 25 percent.[21] Per capita residential use decreased from 59 to 44 gallons per day during the same period, a reduction of 25 percent. Since Fiscal Year 2013-14, residential use decreased from 49 to 44 gallons per day. This 10 percent reduction in residential water use exceeds the 8 percent goal established for San Francisco by the State Water Resources Control Board (SWRCB) in accordance with the Governor's emergency drought regulations (see Regulatory Framework, pp. 4.K.16-4.K.17).

San Francisco comprehensive water conservation program helps sustain a continued reduction in water use. The program is open to residents, municipal facilities, parks, hotels, universities, and all other retail customers. Its core services include indoor and outdoor Water-Wise Evaluations, incentives for replacement of old plumbing fixtures, free water-efficient plumbing devices,

[20] SFPUC, *FY 2014-15 Annual Report*, p. 6.
[21] Ibid.

landscape efficiency programs, tools to monitor water use, and public outreach such as free gardening classes and presentations to schools and stakeholder organizations.

In June 2014, the SFPUC launched a multilingual public education campaign to capture public attention and present everyday water conservation tips and information about the drought. In 2015, the campaign continued with new artwork and messages communicated through a combination of television, newspaper, billboard, bus, commuter transit station, and social media advertisements. The campaign encouraged individuals to adjust their water use practices and pursue water-efficient plumbing fixture upgrades. It also advised individuals to visit the SFPUC's water conservation web site to learn more about conservation services offered. Shortly after launching this campaign, the web site traffic increased by almost 25 percent. The SFPUC extended the campaign to the wholesale service area.

The SFPUC estimates that activities implemented through the water conservation program in Fiscal Year 2014-15 could save 773 million gallons of water over the next 30 years.[22]

In-City Water Distribution Systems

San Francisco maintains two primary water systems within the City and County limits that provide potable and firefighting water to the City, referred to as in-City water distribution systems. One is a low-pressure system that provides potable water from the regional water system for domestic and industrial uses and for firefighting. The potable water distributed in this system is part of the retail water supply described above. The other system is a high-pressure AWSS that provides a supplemental source of non-potable fresh water for firefighting purposes.

Both of these systems are described below. The SFPUC has plans to construct a recycled (reclaimed) water system to provide water for non-potable purposes on the east side of San Francisco, referred to as the Eastside Recycled Water Project; this system is in the planning stages.[23]

Low-Pressure Water System

Domestic potable water is delivered to in-City retail customers via the in-City low-pressure water distribution system, which includes over 1,250 miles of pipeline, 12 reservoirs, 9 storage tanks, and 17 pump stations, all located within the San Francisco city limits.[24] The SFPUC owns, operates, and maintains this system. Potable water is delivered to the project site via an 8-inch

[22] SFPUC, *FY 2014-15 Annual Report*, p. 6.
[23] SFPUC, *San Francisco Eastside Recycled Water Project.* Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=311. Accessed on December 29, 2016.
[24] SFPUC, *2010 UWMP*, p. 7.

main beneath Illinois Street, a 12-inch main beneath 20th Street, and an 8-inch main beneath 22nd Street.[25] The water demand from existing temporary uses at the project site, including special event venues, artists' studios, self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, and office spaces, is 0.0004 mgd.[26]

This system also provides low-pressure water to the site for firefighting purposes. Two fire hydrants were tested in November 2013. One was located on Illinois Street at 22nd Street and one was near the eastern end of 20th Street. The observed flow from the opened hydrants was 900 gallons per minute (gpm) with an 8 pound per square inch (psi) drop in pressure and 1,050 gpm with a 6 psi drop in pressure, respectively. The calculated fire flow rates are 2,029 gpm and 3,195 gpm, respectively, when the minimum residual pressure is allowed to drop to 20 psi.

High-Pressure Auxiliary Water Supply System

The AWSS is San Francisco's emergency firefighting water system that provides high-pressure fresh water and San Francisco Bay water for firefighting in the City. This system supplements the in-City low-pressure water distribution system described above.[27] Citywide, the AWSS includes approximately 200 cisterns, 2 pump stations, 2 storage tanks, 1 reservoir, and approximately 135 miles of pipes. Five fire boat manifolds and wharf hydrants along The Embarcadero also provide connections to San Francisco Bay as a supplemental water source for firefighting.[28] The AWSS also uses portable water systems that consist of large-diameter hoses, pressure-reducing valves, and portable hydrants.[29] The portable systems can be used to draft water from alternative water sources and transport water over long distances when piped water is not available from the in-City low-pressure water distribution system or the existing AWSS facilities.

Constructed following the devastation of the 1906 San Francisco earthquake and fire, the AWSS is over 100 years old, and the SFPUC is currently making improvements to the system as part of Earthquake Safety and Emergency Response bonds passed in 2010 and 2014.[30] The system is

[25] BKF, *Pier 70 Mixed-Use District Project Low Pressure Water System Master Plan*, February 5, 2016 (hereinafter referred to as "*Low Pressure Water System Master Plan*"), Figure 3.1.
[26] BKF, *Pier 70 – Water Demand Memorandum*. April 28, 2016 (hereinafter referred to as "*Pier 70 Water Demand Memorandum*").
[27] SFPUC, *Fact Sheet, Emergency Firefighting Water System Upgrades*, Summer 2012.
[28] San Francisco Fire Department, *Water Supply Systems.* Available online at http://sf-fire.org/water-supply-systems. Accessed December 31, 2015.
[29] AECOM/AGS, *CS-199 Planning Support Services for Auxiliary Water Supply System (AWSS), Project Report*, February 2014
[30] AECOM/WRE, *Emergency Firefighting Water System Earthquake Safety and Emergency Response 2014 Bond Spending Plan Summary*, November 2015, p. 1.

being improved to reliably provide water to supply the probable fire demands based on a hypothetical magnitude 7.8 earthquake on the San Andreas Fault. Once all of the improvements are constructed, each area in San Francisco will have a minimum of 50 percent reliable water supply for this earthquake scenario. Overall, the average Citywide water supply will be a minimum of 90 percent reliable.

In the project vicinity, the AWSS includes a north-south-running 14-inch main under Third Street.[31] As part of Earthquake Safety and Emergency Response bonds, improvements are planned in areas to the south of the project site and at Islais Creek, and also to the west of the project site; however, no improvements are planned in the immediate vicinity of the project site.

Recycled Water System

The project site is located within the City's designated recycled water use area, defined under Article 22 of the San Francisco Public Works Code (see Regulatory Framework, p. 4.K.21). Ultimately, the SFPUC Eastside Recycled Water Project would provide an estimated 2 mgd of recycled water[32] to the bayside (east side) of San Francisco, which includes the project site. The recycled water would be provided for non-potable uses such as irrigation and toilet flushing. However, the Eastside Recycled Water Project is in the planning stages, with construction expected to be completed by the end of 2029.[33]

WASTEWATER AND STORMWATER

Combined Sewer System

The SFPUC maintains and operates a combined sewer system that serves most of San Francisco, including the project site. (For the purposes of this section, the description of the combined sewer system focuses on existing flows to the system and the capacity of the system; see Section 4.O, Hydrology and Water Quality, for a more detailed description of the combined sewer system.) This system collects stormwater runoff and wastewater flows in the same network of pipes and consists of two major drainage basins: the Bayside and Westside Drainage basins, shown on

[31] BKF, *Potential Supplemental Fire Water Description*, March 5, 2015, p. 1

[32] Recycled water is highly treated wastewater that has been purified through multiple levels of treatment to remove pollutants and contaminants so that the water can be used for a variety of applications. The California Department of Public Health has established the treatment standards and regulations regarding recycled water use. Treatment typically consists of filtration to remove solids, some bacteria, and other pollutants. Disinfection destroys any remaining bacteria and viruses, using chemicals (such as chlorine) or non-chemical methods like ultraviolet light. Recycled water can be used for a wide variety of non-potable uses such as irrigation, toilet flushing, cooling, industrial processing, and soil compaction and dust control.

[33] SFPUC, *San Francisco Eastside Recycled Water Project*. Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=311. Accessed December 29, 2015.

Figure 4.O.1: Bayside Drainage Basin Urban Watersheds, in Section 4.O, Hydrology and Water Quality, pp. 4.O.29-4.O.30. The project site is located in the Bayside Drainage Basin, which conveys wastewater and stormwater to the SEWPCP for treatment. The SEWPCP is located on Phelps Street, south of Islais Creek on the eastern waterfront.

The Bayside Drainage Basin includes a system of 653 miles of pipe to convey stormwater and wastewater flows to the SEWPCP, which has a dry-weather capacity of 84.5 mgd. During dry weather (generally May through September), wastewater flows consist mainly of industrial wastewater and sanitary sewage[34] (collectively referred to as wastewater). All dry-weather flows receive secondary treatment before being discharged to San Francisco Bay through the Pier 80 outfall, which has a capacity of 110 mgd.[35] The annual average wastewater flow to the SEWPCP during dry weather is 60 mgd.[36] Therefore, the existing flows are about 71 percent of the treatment capacity, and all dry-weather wastewater flow is treated to a secondary level at the SEWPCP.[37]

During wet weather (generally October through April), up to 250 mgd of wet-weather flows receive treatment at the SEWPCP. The treated wet-weather discharges are discharged to Lower San Francisco Bay through the Pier 80 outfall or to Islais Creek through the Quint Street outfall. Up to an additional 150 mgd of wet-weather flows receive treatment at the North Point Wet Weather Facility, located on the northern side of the City, which operates only during wet weather. Treated effluent from this facility is discharged through four deep-water outfalls, approximately 800 feet from San Francisco Bay shoreline. Two of them terminate at the end of Pier 33, and the other two terminate at the end of Pier 35 on the northeastern San Francisco Bay shore.[38]

The combined sewer system includes storage and transport boxes that, during wet weather, retain the combined stormwater and sewage flows that exceed the capacities of the SEWPCP and the North Point Wet Weather Facility for later treatment. When rainfall intensity results in combined flows that exceed the total capacity of the SEWPCP, the North Point Wet Weather Facility, and the 125-million-gallon capacity of the storage and transport structures, the excess flows are discharged through 29 CSD structures located along the City's bayside waterfront from Marina Green to Candlestick Point. All discharges from the combined sewer system to San Francisco Bay, through either the outfalls or the CSD structures, are operated in compliance with the

[34] Sewage consists of wastewater from toilet or urinal flushing that contains human waste and other wastewater from sanitary conveniences of households and businesses.
[35] RWQCB, *Bayside NPDES Permit*.
[36] SFPUC, *San Francisco's Wastewater Treatment Facilities*, June 2014.
[37] Secondary treatment at the SEWPCP involves aeration with oxygen to enhance the biological breakdown of the combined flows, followed by secondary clarification for further solids removal.
[38] SFPUC, *San Francisco's Wastewater Treatment Facilities*, June 2014.

Bayside NPDES Permit, which regulates discharges from the SEWPCP, the North Point Wet Weather Facility, and all of the Bayside wet-weather facilities, including CSDs, to San Francisco Bay (see Regulatory Framework, in Section 4.O, Hydrology and Water Quality, pp. 4.O.29-4.O.30, for further discussion of the permit).

Stormwater and Wastewater Management at the Project Site

The Proposed Project is entirely located within the 20th Street sub-basin of the Islais Creek watershed, which is part of the City's combined sewer system. This sub-basin is bounded by Illinois Street on the west, 19th Street and the San Francisco Bay shoreline on the north, 22nd Street and the former Potrero Power Plant on the south, and San Francisco Bay on the east. The BAE Systems ship repair area to the north of 20th Street, 20th Street Historic Core site, and the project site (including both the 28-Acre Site and the Illinois Parcels) comprise the total area of this sub-basin. In this sub-basin, both stormwater and wastewater are conveyed to a 54-inch storage and detention pipe along the eastern portion of the site and a 42-inch sewer line beneath 20th Street that are owned by the SFPUC. These sewer lines convey flows to the 20th Street pump station near the northeast corner of the project site. The 20th Street pump station pumps stormwater and wastewater flows through a 10-inch-diameter force main located beneath 20th Street to a 27-inch-diameter gravity sewer main under Illinois Street.[39] From there, the combined stormwater and wastewater flows are conveyed through gravity sewers to the SEWPCP for treatment prior to discharge to San Francisco Bay in accordance with the Bayside NPDES Permit.

When the capacity of the 20th Street pump station is exceeded during wet weather, a portion of the wet-weather flows are stored in the 42- and 54-inch pipes. The 20th and 22nd streets CSD structures discharge flows from the 20th Street sub-basin to the Central Basin of San Francisco Bay when the wet-weather capacities of the 20th Street pump station and associated pipes are exceeded.[40] No dry-weather flows are discharged through these CSD structures.

The pump station was built in 1993. Its dry-weather design capacity is 3.0 mgd.[41] However, volumetric testing conducted by the SFPUC in July 2013 indicates that the pump station's dry-weather capacity is about 2.65 mgd with both pumps running.[42] Based on 24 hours of flow monitoring conducted in August 2013 by the SFPUC during a period of no rainfall, the average dry-weather wastewater flow rate to the pump station was 0.75 mgd at the time of the test and the

[39] A force main is a pipe that conveys liquid by pumping rather than by gravity flow.
[40] RWQCB, *Bayside NPDES Permit*, p. 24.
[41] SFPUC, *Bayside Drainage Basin Urban Watershed Characterization, Final Draft Technical Memorandum*, July 2013, p. 3-21.
[42] SFPUC, 20th Street Pump Station Volumetric Discharge Test and Contributing Flows, Technical Memorandum, August 30, 2013 (hereinafter referred to as "20th Street Pump Station Technical Memorandum"), p. 5.

maximum measured flow rate was 1.5 mgd.[43] Based on this, the SFPUC estimated that the pump station has a remaining dry-weather capacity of about 1.2 mgd.

Port Stormwater Management

The Port of San Francisco (Port) manages approximately 7.5 miles of San Francisco's waterfront from Hyde Street Pier on the north to India Basin on the south.[44] The vast majority of this area is served by separate storm drain systems operated by the Port that drain directly to San Francisco Bay. In other areas of the waterfront, there is no stormdrain system, and stormwater infiltrates into the ground or runs off to San Francisco Bay. All of these areas are classified as municipal separate storm sewer systems (or MS4s) by the SWRCB. Accordingly, stormwater discharges from these areas are regulated under the SWRCB Water Quality Order No. 2013-0001-DWQ, NPDES General Permit for Waste Discharge Requirements (WDRs) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The Port does not currently maintain a separate storm drain system at the project site.

SOLID WASTE

San Francisco's Solid Waste Generation and Disposition

The subsection discusses San Francisco's generation and reduction of solid waste streams, solid waste service, and landfill usage. San Francisco uses a three-cart collection program: residents and businesses sort solid waste into recyclables, compostable items, such as food scraps and yard trimmings, and garbage that cannot be recycled or composted.

Recology provides solid waste collection, recycling, and disposal services for residential and commercial garbage, recycling, and composting in San Francisco through its subsidiaries: San Francisco Recycling and Disposal, Golden Gate Disposal and Recycling, and Sunset Scavenger. All materials are taken to the San Francisco Solid Waste Transfer and Recycling Center in the southeast corner of San Francisco. There, the three waste streams are sorted and bundled for transport to the composting and recycling facilities and landfills.

Recyclable materials (e.g., aluminum, glass, and paper) are sent to Recology's Pier 96 facility (Recycle Central), located on San Francisco's Southern waterfront, where they are separated into commodities and sold to manufacturers that turn the materials into new products.

San Francisco has created the first large-scale urban program for collection of compostable materials in the country. Residents and restaurants and other businesses send food scraps and other compostable material to Recology's Jepson-Prairie composting facility, located in Solano

[43] SFPUC, 20th Street Pump Station Technical Memorandum, p. 3.
[44] Port of San Francisco, *Storm Water Management Plan 2003-2004*, December 2003.

County. Food scraps, plant trimmings, soiled paper, and other compostables are turned into a nutrient-rich soil amendment, or compost.

In September 2015, the City approved an Agreement with Recology, Inc., for the transport and disposal of the City's municipal solid waste at the Recology Hay Road Landfill in Solano County. The City began disposing its municipal solid waste at this landfill in January 2016, and that practice is anticipated to continue for approximately nine years, with an option to renew the Agreement thereafter for an additional six years. San Francisco had a goal of 75 percent solid waste diversion by 2010, which it exceeded at 80 percent diversion, and has a goal of 100 percent solid waste diversion or "zero waste" to landfill or incineration by 2020. San Francisco Ordinance No. 27-06 requires mixed construction and demolition debris be transported by a registered transporter and taken to a registered facility that must recover for reuse or recycling and divert from landfill at least 65 percent of all received construction and demolition debris. The San Francisco Green Building Code also requires certain projects to submit a Recovery Plan to the Department of the Environment demonstrating recovery or diversion of at least 75 percent of all demolition debris. San Francisco's Mandatory Recycling and Composting Ordinance No. 100-09 requires all properties and everyone in the City to separate their recyclables, compostables, and landfill trash.

Project Site Solid Waste Generation and Disposition

The existing land uses at the project site are estimated to produce approximately 400 tons per year of solid waste bound for the Recology Hay Road Landfill, 14 tons per year of recyclables, 1 ton per year of greenwaste, and less than 1 ton per year of wood waste as pallets.[45]

San Francisco's Solid Waste Reduction Efforts

Under the California Integrated Waste Management Act of 1989 (see Regulatory Framework, p. 4.K.18-4.K.19), San Francisco was required to adopt an integrated waste management plan, implement a program to reduce the amount of waste disposed, and undergo a periodic review of its waste diversion performance by the former California Integrated Waste Management Board. (The State agency called CalRecycle has since taken over the functions of the former California Integrated Waste Management Board.) The City was required to reduce the amount of waste sent to landfill by 50 percent by 2000. The City met the 50 percent reduction goal in 2000 by recycling, composting, reuse, and other efforts, and achieved 70 percent reduction in 2006.

[45] A history of annual rates for San Francisco can be viewed at CalRecycle, "Jurisdiction Diversion/Disposal Rate Summary (2007 - Current)" (web page, search for "San Francisco"). Available online at http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionPost2006.aspx. Accessed January 9, 2016.

Under the Solid Waste Disposal Measurement Act, Senate Bill 1016 (2008), the waste diversion rate measurement system was replaced by a simpler approach that sets a 50 percent Equivalent Per Capita Disposal Target (resident or employee) for the State and each jurisdiction. This target rate is updated using the California Department of Finance's yearly population estimates and employment data from the State's Employment Development Department. The target disposal rate for San Francisco residents and employees was 6.6 pounds/resident/day and 10.6 pounds/employee/day, respectively. Both of these targeted disposal rates have been met.[46] As of 2014 (the latest year with available data), San Francisco residents generated about 3.3 pounds/resident/day for disposal, and San Francisco businesses generated about 4.4 pounds/employee/day for disposal.[47]

REGULATORY FRAMEWORK

STATE

Urban Water Management Planning Act

In 1983, the California Legislature enacted the Urban Water Management Planning Act (California Water Code Sections 10610 through 10656). The act has been modified over the years in response to factors such as the State's water shortages and droughts. A significant amendment was made in 2009, after the drought of 2007-2009, and as a result of the governor's call for a Statewide 20 percent reduction in urban water use by the year 2020 (see "Water Conservation Act of 2009," below).

The Urban Water Management Planning Act requires an urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, to prepare a UWMP to support long-term water resource planning and ensure the reliability of its water resources over a 20-year planning horizon. The UWMP must consider availability of water resources during normal, dry, and multiple dry years. The act describes the contents of the UWMP and specifies how urban water suppliers should adopt and implement the plans. In accordance with the Water Conservation Act of 2009, urban water suppliers must also establish water use targets for 2015 and 2020 that would help achieve a Statewide savings of 20 percent by 2020. The Urban Water Management Planning Act requires that UWMPs be updated every five years, in years ending with "0" or "5."

[46] Ibid.

[47] CalRecycle, "Jurisdiction Diversion/Disposal Rate Detail" (web page) (for San Francisco 2014 data), available at http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionDetail.aspx?JurisdictionID=438&Year=2014. Accessed January 9, 2016.

Water Conservation Act of 2009

The Water Conservation Act of 2009, also known as Senate Bill X7-7, requires the State to set a goal of reducing urban water use by 20 percent by the year 2020. In turn, each retail urban water supplier must determine baseline water use during their baseline period and must also specify water use targets for the years 2015 and 2020 in order to help the State achieve the reduction. Water agencies are required to demonstrate compliance with their established water use target for the year 2015 in their 2015 UWMPs. To calculate these targets, suppliers use two baselines. Water agencies that do not supplement their water supply with at least 10 percent recycled water, such as the SFPUC, must calculate a 10-year baseline based on water use over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010. All water agencies must also calculate the five-year baseline, referred to as the target confirmation, over a continuous five-year period that ends no earlier than December 31, 2007, and no later than December 31, 2010. Average water use is calculated as gallons per capita per day, i.e., the amount of water used per person per day.

Emergency Drought Regulations

On January 17, 2014, Governor Edmund G. Brown declared a State of Emergency in California due to severe drought conditions. His Executive Order B-29-15, issued on April 1, 2015, required the SWRCB to adopt an Emergency Regulation imposing a mandatory Statewide urban potable water use reduction of 25 percent compared to 2013.[48] The emergency regulation is contained in Title 23 of the California Code of Regulations, Division 3, Chapter 2, Sections 863 through 866. These mandatory requirements took effect starting June 2015 and in accordance with Executive Order B-36-15 remain in effect through October 31, 2016.[49]

To reach the Statewide 25 percent reduction mandate, the emergency regulation assigns each urban water supplier a conservation standard that ranges between 4 and 36 percent based on their residential gallons-per-capita-per-day water use for the months of July to September 2014.[50] San Francisco's per capita residential water use at that time was about 49 mgd,[51] among the lowest in the State and below the Statewide per capita goal of 55 gallons per day. Based on this water usage, San Francisco is required to achieve an 8 percent reduction in water use relative to use in 2013 to help achieve the Statewide reduction of 25 percent.

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[48] State of California, Executive Department, *Executive Order B-29-15*, April 1, 2015.
[49] State Water Resources Control Board (SWRCB), *Resolution No. 2016-0007, To Adopt and Emergency Regulation for Statewide Urban Water Conservation*, February 2, 2016.
[50] State Water Resources Control Board, *Urban Water Supplier Conservation Standard for Extended Emergency Regulation Rulemaking – 2016. Supplier Conservation Standards – Effective March 1, 2016.* April 7, 2015.
[51] SFPUC, *FY 2014-15 Annual Report*, p. 6.

Governor Brown issued Executive Order B-37-16 (Making Water Conservation a Way of Life) on May 9, 2016. This executive order calls for maintaining the 25 percent reduction in water use and implementing the following water use efficiency improvements:

- Developing new urban water use targets that generate more water conservation than existing requirements;
- Reducing water loss; and
- Improving urban Water Shortage Contingency Plans and reporting requirements.

The executive order also includes new requirements for agricultural water suppliers.

In accordance with Executive Order B-37-16, the Water Shortage Contingency Plans for urban water suppliers must demonstrate adequate actions to respond to droughts lasting five years or more, as well as more frequent and severe periods of drought. This executive order also requires urban water suppliers to issue monthly reports on their water usage, amount of conservation achieved, and any enforcement efforts.

On May 18, 2016, the SWRCB adopted a Statewide water conservation approach that allows urban water suppliers to replace their prior State-assigned percentage target reduction with a localized "stress test" approach based on showing whether they have at least a three-year water supply under extended drought conditions.[52] This revised emergency regulation was promulgated after water supply conditions improved significantly in most of the State and recognizes that urban water suppliers are now better positioned to respond to drought impacts following their conservation efforts throughout the recent drought. The revised regulation requires individual urban water suppliers to self-certify the level of available water supplies they have assuming three additional dry years. Wholesale water agencies were also required to include documentation about how regional supplies would fare under three additional dry years. Both urban water suppliers and wholesale suppliers are required to report the underlying basis for their assertions, and urban water suppliers are required to continue reporting their conservation levels.

Water Supply Assessment – Senate Bill 610

Senate Bill 610 (Water Code Sections 10910 through 10915), effective January 1, 2002, requires cities and counties to confirm that sufficient water supply sources are available before specified large development projects are approved. Confirmation is provided in a Water Supply Assessment that must be prepared for projects that include (1) the equivalent demand of 500 residential units; (2) a shopping center or business establishment that employs more than 1,000 persons or has a floor space of more than 500,000 square feet; or (3) a commercial office building

[52] State Water Resources Control Board, Fact Sheet, State Water Resources Control Board Posts 36-Month Urban Water Supply Stress Test Submissions, August 15, 2016.

that employs more than 1,000 persons or has a floor space of more than 250,000 square feet. The Water Supply Assessment for a proposed project must be included in that project's California Environmental Quality Act (CEQA) document. The Pier 70 Mixed Use District Project requires a Water Supply Assessment because it meets all of these criteria.

Water Supply Verification

California Government Code Section 66473.7 requires that a condition be included in any tentative subdivision map or development agreement for a residential subdivision of 500 or more units mandating that a "sufficient water supply" be available to serve the subdivision in addition to other existing and planned future water uses. The water provider must submit to the city or county a water supply verification evaluating whether such a sufficient water supply exists, based on substantial evidence. If verification of a sufficient water supply cannot be provided, a final subdivision map cannot be issued for the subdivision, and the subdivision cannot be built.

Wholesale Regional Water System Security

The SFPUC regional water supply system provides potable drinking water to the SFPUC's wholesale and retail water customers and is also used to generate clean and renewable hydroelectric power. California Water Code Sections 73500 through 73514 (the Wholesale Regional Water System Security and Reliability Act) specify requirements related to the security and reliability of San Francisco's regional water system. Section 73504(b) requires the SFPUC to assign higher priority to delivery of water to the Bay Area than to the generation of electric power.

National Pollutant Discharge Elimination System Permits

The Porter-Cologne Water Quality Control Act authorizes the SWRCB to issue and enforce NPDES permits. In addition, the SWRCB develops water quality standards and performs other functions to protect California's waters. The Regional Water Quality Control Boards carry out the SWRCB regulations and standards and also issue and enforce permits. The NPDES permit applicable to the Proposed Project that pertains to utilities and service systems is the Bayside NPDES Permit that governs operation of the City's combined sewer system (see Regulatory Framework in Section 4.O, Hydrology and Water Quality, pp. 4.O.29-4.O.30, for further discussion of the permit).

California Integrated Waste Management Act – Assembly Bill 939

Among the California statutes regulating solid waste, the California Integrated Waste Management Act (CIWMA), Assembly Bill 939 (1989), was landmark legislation. The CIWMA mandated that source reduction be the highest priority waste management strategy, followed by

recycling and composting, and environmentally safe transportation and land disposal. The law requires that each county prepare an Integrated Waste Management Plan, replacing the earlier County Solid Waste Management Plan. The CIWMA and later revisions required that counties, cities, and regional agencies prepare a source reduction and recycling element in its plan for diversion of 25 percent of all solid waste from landfills or transformation facilities by 1995, and 50 percent by 2000, using a 1989 baseline.

Solid Waste Disposal Measurement Act – Senate Bill 1016

The Solid Waste Disposal Measurement Act, Senate Bill 1016 (2008), changed the metric for evaluating success in California's solid waste management. The act maintained the 50 percent diversion requirement set forth under the CIWMA, but addressed the problem that calculating the diversion rate was a complex, time-consuming, and difficult process. Instead, the act provided for a 50 percent Equivalent Per Capita Disposal Target. This per capita disposal target is the amount of disposal a jurisdiction would have had during the base period, if it had been exactly at a 50 percent diversion rate. The 50 percent Equivalent Per Capita Disposal Target is calculated by dividing the average of 2003-2006 per capita generation in half. Each jurisdiction has a specific 50 percent Equivalent Per Capita Disposal Target that cannot be compared to other jurisdictions. In addition, for jurisdictions that already met the 50 percent diversion rate at that time, such as San Francisco, annual waste generation studies are no longer required, allowing more resources to be focused on the development or maintenance of waste reduction strategies.

LOCAL

San Francisco Non-potable Water Program

In September 2012, the City adopted the Onsite Water Reuse for Commercial, Multi-family, and Mixed Use Development Ordinance. Commonly known as the Non-potable Water Ordinance, it added Article 12C to the San Francisco Health Code, allowing for the collection, treatment, and use of alternate water sources for non-potable applications. In October 2013, the City amended the ordinance to allow district-scale water systems, defined as systems consisting of two or more buildings sharing non-potable water. The City also amended the ordinance in July 2015, requiring new construction to use alternative water supplies for non-potable use. The requirements of this program stipulate that:

- All new buildings of 250,000 square feet or more of gross floor area located within the boundaries of San Francisco's designated recycled water use area be constructed, operated, and maintained using available alternate water sources for toilet and urinal flushing and irrigation;
- All new buildings in San Francisco of 40,000 square feet or more of gross floor area prepare water budget calculations; and

- Subdivision approval requirements specify compliance with Article 12C of the San Francisco Health Code.

(See "San Francisco Non-potable Water Program" in Section 4.O, Hydrology and Water Quality, pp. 4.O.39-4.O-40, for more information.)

The City is considering adoption of an ordinance that would revise the definition of large and small developments. If adopted, the ordinance would change to definitions for development projects as follows:

- Large developments: new single buildings of 250,000 square feet or more of gross floor area and multiple buildings constructed in accordance with a phased plan or approval with a total gross floor area of 250,000 square feet or more.
- Small developments: single buildings of 40,000 square feet or more of gross floor area and multiple buildings constructed in accordance with a phased plan or approval with a total gross floor area of 40,000 square feet or more.

If adopted, all developments within the Pier 70 Special Use District (SUD) would need to comply with the non-potable water ordinance because they would be part of a subdivision approval comprising more than 250,000 square feet of gross floor area. The analysis of water supply impacts below assumes that all developments within the SUD would be required to comply.

Potential alternate water sources that could be used to meet the requirements of this program include greywater (water from bathroom sinks, showers, clothes washing machines, and similar sources that do not contain food waste or human excrement), rainwater, and groundwater from foundation dewatering. Potable water has historically been used to serve most or all water needs within commercial, industrial, and residential buildings and for landscaping. Use of these non-potable water sources for non-potable uses such as toilet and urinal flushing, building cooling, and landscaping helps reduce the quantity of potable water needed for building operation.

The Non-potable Water Program received 13 water budget applications in Fiscal Year 2014-15 to install on-site water systems.[53] Twelve of the projects are individual building-scale projects, and one is a district-scale project (a district-scale project is one that consists of two or more buildings sharing non-potable water). The 13 new projects propose to offset the use of approximately 16 million gallons per year of potable water. Combined with 13 projects from Fiscal Year 2012-13 and 20 projects from Fiscal Year 2013-14, the estimated total offset is 24 million gallons of potable water each year, or an average of 0.07 mgd.

[53] SFPUC, *FY 2014-15 Annual Report*, p. 13.

San Francisco Recycled Water Use Ordinance

Article 22 of the San Francisco Public Works Code, referred to as the Recycled Water Use Ordinance, requires property owners located within designated recycled water use areas to install recycled water systems in new construction, modified, or remodel projects. This applies to following types of developments:

- New construction or major alterations to a building totaling 40,000 square feet or more;
- All subdivisions; and
- New and existing irrigated areas of 10,000 square feet or more.

The recycled water use area comprises the majority of the City's bayside waterfront and some inland areas, as well as Treasure Island. The goal of the ordinance is to maximize the use of recycled water, and buildings and facilities subject to this ordinance must use recycled water for all uses authorized by the State once a source of recycled water is available. Commonly approved uses include irrigation, cooling, and/or toilet and urinal flushing.

In a mixed-use residential building with a recycled water system, any restaurant or other retail food-handling establishment must be supplied by a separate potable water system to ensure public health and safety.

As discussed under "Recycled Water System," p. 4.K.10, the SFPUC Eastside Recycled Water Project would ultimately provide an estimated 2 mgd of tertiary recycled water on the bayside of San Francisco. However, construction of the Eastside Recycled Water Project would not be completed until the end of 2029.[54] While the Proposed Project is subject to the Recycled Water Use Ordinance, there is currently no available source of recycled water.

San Francisco Drought Response Requirements

The SFPUC implemented a Mandatory Irrigation Allocation Program in 2015 in accordance with SFPUC Resolution 15-0119.[55] This program requires all potable irrigation customers to reduce their irrigation water use by 25 percent, effective July 1, 2015. The SFPUC has provided irrigation account holders with their water use allocations using 2013 baseline water use data. If potable water use exceeds the allocation, an Excess Use Charge of 100 percent of the applicable water is charged for each unit of water exceeding the allocation.

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[54] SFPUC, *San Francisco Eastside Recycled Water Project*. Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=311. Accessed December 29, 2015.

[55] City and County of San Francisco, Public Utilities Commission, *Resolution No. 15-0119*, May 26, 2015.

Mayor Edwin M. Lee also issued Executive Directive 14-01 on February 10, 2014, requesting water customers to reduce overall water use by 10 percent relative to 2013, effective June 1, 2015.[56] This directive also requires all City departments to develop a Water Conservation Plan and take steps to achieve a 10 percent reduction in water use. City department heads have been asked to report innovative conservation strategies to the SFPUC for the purposes of sharing best practices with other departments.

San Francisco Water Efficient Irrigation Ordinance

The San Francisco Water Efficient Irrigation Ordinance (codified in the San Francisco Administrative Code, Chapter 63) establishes a framework for planning, designing, installing, maintaining, and managing water-efficient landscaping in new construction and rehabilitation projects to reduce the amount of potable water used for irrigation. The ordinance encourages the use of climate-appropriate and local California native species, and establishes provisions for water management and the prevention of wasteful use of water in landscapes. To ensure that water is used efficiently without waste, the ordinance sets a Maximum Applied Water Allowance, using State-mandated formulas that account for local climatic conditions; this allowance may not be exceeded unless the landscaped area is irrigated with non-potable water such as greywater or harvested rain water.

San Francisco Public Works Code, Article 21 – Restriction of Use of Potable Water for Soil Compaction and Dust Control Activities

Article 21 of the San Francisco Public Works Code prohibits the use of potable water supplies for soil compaction and dust control when alternative supplies are available. Projects subject to this ordinance may use the recycled water available at the SEWPCP truck-fill station, which may be accessed 24 hours a day, 7 days a week. The station offers both top- and side-fill options and dispenses recycled water at 400 gpm. The automated fill station allows access to larger tanker trucks. The annual volume of recycled water dispensed from this station increased from about 300,000 to 739,000 gallons (an average of 0.001 to 0.002 mgd) between 2014 and 2015.[57]

San Francisco Public Works Code, Article 4.2 - Stormwater Management Requirements and Design Guidelines

Development projects that discharge stormwater to either the combined sewer system or a separate stormwater system must comply with Article 4.2 of the San Francisco Public Works Code, Section 147, which was last updated on May 27, 2016. The SFPUC and the Port have

[56] City and County of San Francisco, Office of the Mayor, *Executive Directive 14-10, Water Conservation – City Departments*, February 10, 2014.
[57] SFPUC, *2015 Urban Water Management Plan for the City and County of San Francisco*, June 2016, p. 6-13.

developed San Francisco Stormwater Management Requirements and Design Guidelines (SMR) in accordance with the requirements of the Small MS4 General Stormwater Permit and Article 4.2, Section 147.

In accordance with the SMR, developers of projects that would create and/or replace 5,000 square feet or more of impervious surfaces and discharge to the combined sewer system must implement best management practices (BMPs) to manage the flow rate and volume of stormwater going into the combined sewer system by achieving LEED® Sustainable Sites Credit 6.1 (Stormwater Design: Quantity Control). This credit includes two different standards for post-construction stormwater controls depending on the amount of existing impervious surfaces. For covered projects with 50 percent existing impervious surfaces or less, the stormwater management approach must prevent the stormwater runoff flow rate and volume from exceeding existing conditions for storms the produce a rainfall depth of 2.9 inches in 24 hours and a rainfall intensity of approximately 2.4 inches per hour (referred to as the one- and two-year 24-hour design storm). For covered projects that include more than 50 percent existing impervious surfaces, the stormwater management approach must reduce the existing stormwater runoff flow rate and volume by 25 percent for a two-year 24-hour design storm.

Developers of projects that discharge to a separate stormwater system must also implement BMPs to improve the quality of stormwater going into the separate stormwater system. In areas served by separate sewer systems, the SMR specifies varying performance requirements according to the following project size thresholds:

- Small Project: 2,500 to 5,000 square feet of impervious surface created and/or replaced.
- Large Project: 5,000 square feet or more of impervious surface created and/or replaced.

Small Projects that discharge to a separate sewer system must implement one or more Site Design Measure(s) (e.g., tree planting and preservation; permeable pavement; green roofs; vegetated swales; and rainwater harvesting). Large Projects must implement source controls and BMPs to meet performance requirements. Large Projects located on Port property must manage runoff from storms that produce a rainfall depth of 0.63 inch in 24 hours and a rainfall intensity of approximately 0.2 inch per hour (referred to as the 85th percentile, 24-hour storm). Large Projects within the Hoedown Yard would be under SFPUC jurisdiction and must manage runoff from storms the produce a rainfall depth of 0.75 inch in 24-hours and a rainfall intensity of approximately 0.24 inch per hour (referred to as the 90th percentile, 24-hour storm).

Modified Compliance Program

The City has developed the Modified Compliance Program to allow development projects with proven site challenges and limitations to modify the standard stormwater performance

requirements set by the Stormwater Design Guidelines. The Modified Compliance Program applies only to projects served by the combined sewer system.

In order to qualify for modified compliance, a site owner must submit a modified compliance application to the SFPUC that documents existing and proposed site features that limit infiltration such as high groundwater, shallow depth to bedrock, poorly infiltrating soils, steep slopes, contamination, or limited space for infiltration. The application also requires the applicant to estimate the non-potable demand for the project if the project is subject to the City's Recycled Water Ordinance. Based on this information, the SFPUC can decrease the amount the applicant must reduce the stormwater runoff volume, and would increase the required flow rate reduction by the same percentage.

San Francisco Subdivision Regulations

San Francisco's Subdivision Regulations dated March 24, 2015, serve as general guidelines for the planning, development, design, and improvement of subdivisions in San Francisco. The regulations were established pursuant to San Francisco Subdivision Code Section 1311 and supplement Public Works Code Section 147.2(b)(2), Approvals for Subdivision Stormwater Control Plans, and Section 1204(b)(2), Approvals for Subdivisions located in Recycled Water Use Areas, as well as other applicable City regulations. In accordance with the Subdivision Regulations, developers of proposed subdivisions must submit a tentative map and other application materials to the City and County Surveyor, who conveys these materials to the Planning Department and other City agencies for review and recommendations. A tentative map must be prepared for all subdivisions consisting of five or more units or lots, and must show the layout of all proposed underground utilities. It must also note any infrastructure improvements necessary to make the utility facilities operable, either on- or off-site. Engineering documents, including grading plans and utility plans, must be submitted with the tentative map and demonstrate compliance with the design criteria provided in Appendix B of the Subdivision Regulations.

Once the tentative map has been completed and San Francisco Public Works has determined that all conditions of approval have been completed, the subdivider must prepare a final map within 24 months. The subdivider may prepare phased Final Maps for individual phases of the development, if approved by the Director of Public Works. Some of the required information may be deferred to later phases of the project if they may change, be refined, or become outdated during development. All final maps are subject to approval by the Board of Supervisors.

For the construction of public improvements, such as a new pump station and sewer system infrastructure, the Subdivision Regulations require a Public Improvements Agreement between the developer and San Francisco Public Works in the case that the public improvements are not

completed before the Final Map is recorded. The Director of Public Works shall not sign or record a Final Map until Public Works has received and approved all improvement securities that are required to guarantee the performance of the public improvement. San Francisco Public Works requires a performance bond or other acceptable security in the amount of 100 percent of the estimated cost of completion of unfinished public improvements, or installation of all public improvements, as determined by the City Engineer. City-approved Improvement Plans are required for all Public Improvement Agreements.

San Francisco Zero Waste Policies

San Francisco has developed many programs and policies to manage and reduce its solid waste and to divert solid waste from landfill disposal. In 2002, the Board of Supervisors passed the Resolution Adopting Zero Waste Goal, which stated that San Francisco had a goal of 75 percent solid waste diversion by 2010 and a long-term goal of zero waste.[58] San Francisco diverted 80 percent of its solid waste in the year 2010. In 2003, the Board of Supervisors passed the Resolution Setting Zero Waste Date, which stated that San Francisco's future goal is 100 percent solid waste diversion by 2020.[59]

San Francisco Construction and Demolition Waste Ordinance

Under the San Francisco Construction and Demolition Debris Recovery Ordinance (Ordinance No. 27-06),[60] no construction and demolition material may be taken to landfill or placed in the garbage. All (i.e., 100 percent) mixed debris must be transported by a registered hauler to a registered facility to be processed for recycling. The ordinance also requires a minimum of 65 percent of all demolition debris to be recycled and diverted from landfills. This ordinance applies to all construction projects, including new construction, remodeling, and partial demolitions.

Demolition of an existing structure requires submission of a Demolition Debris Recovery Plan to the Department of the Environment. The Department must approve the plan, prior to the

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[58] City and County of San Francisco, Resolution No. 679-02, Resolution for 75% Waste Diversion Goal, September 30, 2002. Available online at http://sfenvironment.org/sites/default/files/editor-uploads/zero_waste/pdf/resolutionzerowastedate.pdf. Accessed December 28, 2015.

[59] City and County of San Francisco, Resolution No. 002-03-COE, Resolution Adopting a Date of 2020 for San Francisco to Achieve the Goal of Zero Waste to Landfill and Directing the Department of the Environment to Develop Policies and Programs to Increase Producer and Consumer Responsibility in Order to Achieve the Zero Waste Goal, March 6, 2003. Available online at http://sfenvironment.org/sites/default/files/editor-uploads/zero_waste/pdf/resolutionzerowastedate.pdf. Accessed December 28, 2015.

[60] San Francisco Environment Code, Ordinance No. 27-06 Summary, February 2006. Available online at http://www.sfenvironment.org/sites/default/files/fliers/files/cd_ordinance.pdf. Accessed December 23, 2015.

Department of Building Inspection (DBI) issuing a Full Demolition Permit (Form 6). The plan must demonstrate how a minimum of 65 percent of the material from the demolition will be diverted from landfills.

Green Building Ordinance

The City's Green Building Ordinance, which originally became effective January 1, 2009, and was amended as recently as 2013, requires that at least 75 percent of a project's construction debris be diverted from the landfill.[61] The ordinance requires that new development projects provide adequate areas for recycling, composting, and trash storage. The collection and loading facilities, including any chute systems, must be designed for equal convenience for all users to separate those three material streams, and must provide space to accommodate a sufficient number and type of containers to be compatible with current methods of collection.

Mandatory Recycling & Composting Ordinance

In June 2009, the Board of Supervisors passed the Mandatory Recycling & Composting Ordinance, which requires all of San Francisco to separate recyclables, compostables, and landfilled trash. It is unlawful to mix recyclables, compostables, or trash, or to deposit refuse of one type in a collection container designated for another type of waste. Owners or managers of apartments, condominiums, tenancies in common, food establishments, and event venues are required to maintain appropriate, color-coded (blue for recyclables, green for compostables, and black for trash), labeled containers in convenient locations. These owners and managers must educate tenants, employees, and contractors (including janitors) on what materials go in each container.

Additional Solid Waste Ordinances

The City's Plastic Bag Reduction Ordinance requires the use of compostable plastic, recyclable paper and/or reusable checkout bags by supermarkets and drugstores.

The Food Service Waste Reduction Ordinance requires restaurants and food vendors to use food storage ware that is made of compostable or recyclable material rather than styrofoam.

The Resource Conservation Ordinance requires City departments to reduce waste, maximize recycling, and buy products with recycled content.

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[61] City and County of San Francisco, Ordinance No. 259-13, Green Building Code – Enactment of New Code, August 14, 2013. Available online at http://www.energy.ca.gov/title24/2013standards/ordinances/sanfrancisco/San_Francisco_Submittal_to_California_Energy_Commission.pdf. Accessed January 8, 2016.

San Francisco General Plan

The *San Francisco General Plan* Environmental Protection Element includes the following policies relevant to water supply systems:

Policy 5.1: Maintain an adequate water distribution system within San Francisco.

Policy 5.2: Exercise controls of development to correspond to the capabilities of the water supply and distribution system.

Policy 6.1: Maintain a leak detection program to prevent the waste of fresh water.

Policy 6.2: Encourage and promote research on the necessity and feasibility of water reclamation.

The Environmental Protection Element also includes the following policy relevant to wastewater and stormwater:

Policy 3.3: Implement plans to improve sewage treatment and halt pollution of the Bay and Ocean.

The *San Francisco General Plan* Community Facilities Element also includes the following objective and policy relevant to wastewater and stormwater:

Objective 10: Locate wastewater facilities in a manner that will enhance the effective and efficient treatment of storm and wastewater.

Policy 10.1: Provide facilities for treatment of storm and wastewater prior to discharge into the Bay or ocean. Locate such facilities according to the Wastewater and Solid Waste Facilities Plan.

The Community Facilities Element also contains the following objective and policy relating to solid waste facilities:

Objective 11: Locate solid waste facilities in a manner that will enhance the effective and efficient treatment of solid waste.

Policy 11.1: Provide facilities for treatment of solid waste and locate such facilities as shown on the Wastewater and Solid Waste Facilities Plan.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on utilities and service systems as they relate to water, wastewater, stormwater, and solid waste. Implementation of the Proposed Project would have a significant effect on utilities and service systems if the project would:

K.1 Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

K.2 Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

K.3 Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

K.4 Have insufficient water supply available to serve the project from existing entitlements and resources, or require new or expanded water supply resources or entitlements;

K.5 Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;

K.6 Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or

K.7 Not comply with federal, state, and local statutes and regulations related to solid waste.

The Proposed Project would not substantially increase the amount of wastewater generated during construction. Therefore, there would be no impact related to Criteria K.1, exceeding wastewater treatment requirements; K.2, construction or expansion of wastewater facilities; or K.5, determination from the wastewater treatment provider that is has inadequate capacity during construction.

Because the Proposed Project would not increase the amount of stormwater runoff from the site during construction and would not warrant construction or expansion of existing storm drainage facilities, there would be no impact related to Criterion K.3, construction or expansion of stormwater drainage facilities during construction.

APPROACH TO ANALYSIS

Potential water supply impacts during operation are assessed with respect as to whether the SFPUC has sufficient water supply to serve the Proposed Project and whether the Proposed Project would result in the need for the construction of new water facilities or expansion of existing facilities. Potential wastewater impacts during operation are assessed with respect to whether the Proposed Project would exceed the wastewater treatment requirements of the Bayside wastewater treatment facilities; result in the need for the construction of new wastewater treatment facilities or expansion of existing facilities; or result in a determination by the SFPUC that it has inadequate capacity to serve the Proposed Project's projected wastewater demand in

addition to existing commitments. Stormwater impacts during operation are assessed with respect to the need for the construction of new stormwater drainage facilities or construction of new facilities.

The water supply analysis summarizes the projected water demands of the Proposed Project, including the use of recycled water, when and if it becomes available. The analysis also summarizes the SFPUC's Water Supply Assessment, which makes a determination as to whether there are sufficient water supplies from the regional water system to serve the Proposed Project. If there is a sufficient supply, the impact analysis concludes that water supply impacts would be less than significant. The water facilities analysis focuses on whether the existing and proposed water distribution system is sufficient to serve the Proposed Project's operational water use and firefighting demands.

The wastewater impact analysis addresses the treatment capacity of the SEWPCP and the downstream capacity of the City's combined sewer system to assess whether project-related wastewater and stormwater flows would exceed existing capacities. If not, impacts associated with exceeding the capacity of the SEWPCP, expansion of existing wastewater facilities, and a determination from the SFPUC that it has inadequate capacity to serve the project's projected demand would be less than significant. Regarding stormwater, the impact analyses focus on whether existing and proposed conveyance facilities have sufficient capacity to accommodate stormwater flows from the project site.

The impact analysis addresses generation of solid waste during construction and operation of the Proposed Project. Construction-related solid waste is evaluated in terms of City and State recycling requirements. Regarding operation-related solid waste, the analysis estimates the amount of solid waste expected to be generated during operation and compares this amount to estimates of existing City solid waste volume and landfill capacity. Requirements for recycling, composting, and reuse of solid waste materials are discussed in relation to the Proposed Project's solid waste generation.

PROJECT FEATURES

The Proposed Project includes two land use scenarios: the Maximum Residential Scenario, which reflects the most-intensive residential use of the project site, and the Maximum Commercial Scenario, which reflects the most-intensive commercial use of the project site. The two scenarios bracket specific maximum ranges of uses that could be developed under the proposed SUD and are mutually exclusive. During operation, water and wastewater demands would depend on the proposed land use and would differ between the Maximum Residential Scenario and Maximum Commercial Scenario. The analysis of water and wastewater impacts considers both scenarios.

The Proposed Project includes the installation of new infrastructure for the distribution of potable water, emergency firefighting water, and recycled water, as well as for the conveyance of wastewater and stormwater as described in "Proposed Infrastructure and Utilities" in Chapter 2, Project Description, pp. 2.55-2.67. This infrastructure includes a new pump station to replace the existing 20th Street pump station, along with potential replacement of the existing 10-inch force main and relocation of the existing 54-inch-diameter storage and detention pipeline. As stated in the impact analyses below, construction of this infrastructure under the Proposed Project would comply with the design criteria of San Francisco's Subdivision Regulations, and the design would be subject to review and approval by the SFPUC and SFFD.

The Proposed Project also includes three wastewater and stormwater management options: continued use of the City's combined sewer system (Option 1); construction of a new separate stormwater system and a new separate wastewater system (Option 2); and a hybrid system that would utilize both (Option 3). The analysis of stormwater impacts considers all three options.

Construction of the Proposed Project would result in construction and demolition debris, as well as waste soil from excavation of the 15- to 27-foot basements on some of the parcels and infrastructure improvements (e.g., utilities, streets, and open space). Solid waste disposal facilities at the residential and commercial buildings and open spaces associated with the Proposed Project would include three types of bins for segregating solid waste that can be recycled, composted, or would go to the landfill. The Proposed Project would comply with a variety of solid waste-related laws and regulations, as discussed in the Regulatory Framework section.

IMPACT EVALUATION

Water Supply and Facilities

Impact UT-1: The City's water service provider would have sufficient water supply available to serve the Proposed Project from existing entitlements and resources, and the Proposed Project would not require new or expanded water supply resources or entitlements. ***(Less than Significant)***

Construction

During construction, the Proposed Project would intermittently use non-potable water for dust control in accordance with Article 21 of the San Francisco Public Works Code and would use relatively small amounts of potable water for some site needs such as drinking water, on-site sanitary needs, and for cement mixing. The small increase in potable water demand would not be substantial. In addition, this water use would be temporary, terminating with the completion of construction. Water supplies are planned such that short-term spikes in water use can be

accommodated. Therefore, project construction would not warrant construction or expansion of water treatment facilities, and this impact would be less than significant during construction.

Operation

The evaluation of water supplies available for operation of the Proposed Project compares the amount of water that would be used for its operation under both development scenarios (referred to as the water demand) to the availability of water from the SFPUC's retail water supply. The water demand considers three sets of conditions. The first set of conditions is based on serving all site uses with potable water. However, the Proposed Project would be required to use an alternate water supply to fulfill some of its non-potable uses in accordance with the City's Non-potable Water Program. The second set of conditions is based on compliance with the City's Non-potable Water Program, and presents the projected potable and alternate water supply demands. The third set of conditions presents what the projected potable, alternate, and recycled water demands would be once off-site recycled water becomes available through the City's Eastside Recycled Water Project. As discussed on p. 4.K.34, the SFPUC has determined in its Water Supply Assessment that its retail water supplies are sufficient to meet the entire demand of the Proposed Project through 2035.[62]

The existing water demand at the project site is 0.0004 mgd[63] for on-site temporary uses including special event venues, artists' studios, self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, and office spaces. This is a negligible portion of the anticipated water demands under the Proposed Project. The water demands presented below represent the increased water demand that would occur under both the Maximum Residential Scenario and Maximum Commercial Scenario.

Water Demands Based on Using All Potable Water

The water demand memorandum prepared by the sponsors for the Proposed Project indicates that at full build-out, the total average water demand for the Proposed Project would be 0.51 mgd under the Maximum Residential Scenario and 0.44 mgd under the Maximum Commercial Scenario, as summarized in Table 4.K.4: Average Daily Water Demands at Full Build-out.[64] These estimates assume that potable water would be used for all indoor potable water and non-potable water demands as well as for landscape irrigation and cooling water. This represents the

[62] Public Utilities Commission, City and County of San Francisco, *Resolution No. 16-0095 approving May 24, 2016 Water Supply Assessment for the Pier 70 Project*, May 24, 2016.
[63] BKF, Pier 70 *Water Demand Memorandum*.
[64] BKF, *Pier 70 Water Demand Memorandum*.

Table 4.K.4: Average Daily Water Demands at Full Build-out

	Demand for Potable Water (mgd)	Demand for On-Site Alternate Water Supply (mgd)	Demand for Off-Site Recycled Water (mgd)
Proposed Project's water demand assuming an all-potable supply			
Maximum Residential Scenario	0.51	0	0
Maximum Commercial Scenario	0.44	0	0
Proposed Project's water demand with compliance with Non-potable Water Program			
Maximum Residential Scenario	0.38	0.13	0
Maximum Commercial Scenario	0.29	0.15	0
Proposed Project's water demand in the future when off-site recycled water is available from the City			
Maximum Residential Scenario	0.38	0.13	0.006
Maximum Commercial Scenario	0.29	0.15	0.006

Note:
mgd = million gallons per day

Source: BKF, Pier 70 Water Demand Memorandum

total water demand for the Proposed Project. However, as noted below, the use of potable water would be offset with the use of an alternate water supply, in accordance with the City's Non-potable Water Program.

The residential potable water unit demand is based on 116.5 gallons per day per dwelling unit,[65] assuming 50 gallons per capita per day and 2.33 residents per dwelling unit. These assumptions are consistent with those used by the City for forecasting water demands and are somewhat conservative, given the current per capita use in the City of 44 gallons per day.[66] The total average water demand for commercial, retail, and arts/light industrial establishments is based on 0.07 gallons per day per square foot, consistent with the current California Green Building Code.

The total water demand for restaurants is based on an assumption that half of a 1,000-square-foot restaurant is dedicated to seating areas and the other half is used as the kitchen, bar, restrooms, and other facilities.[67] Each restaurant is assumed to have a total of 20 seats, and the water use is assumed to be 25 gallons per seat per day, consistent with standard methodologies used by the American Water Works Association. Based on this, the potable water unit demand for a restaurant is 0.5 gallon per day per square foot. Water use for landscape irrigation is based on

[65] BKF, *Pier 70 Water Demand Memorandum*.
[66] SFPUC, *FY 2014-15 Annual Report*, p. 6.
[67] BKF, *Pier 70 Water Demand Memorandum*.

compliance with the City's Water Efficient Landscape Irrigation Ordinance. Water use for cooling towers is based on standard engineering assumptions.

Water Demands Based on Compliance with Non-potable Water Program

The project site is located within the City's designated recycled water use area (defined under Article 22 of the San Francisco Public Works Code) and would be required to comply with San Francisco's Non-potable Water Program. This program would require buildings within the project site to use available alternate water sources such as rainwater and greywater (rather than potable water) for non-potable purposes such as toilet and urinal flushing and irrigation. The alternate water supplies could also be used in cooling towers used to cool the proposed buildings.

The estimates for non-potable demands under the Non-potable Water Program are based on 8 gallons per capita per day and 2.33 residents per dwelling unit for toilet flushing under residential uses and 0.035 gallon per day per square foot for commercial, retail, and arts/light industrial uses. Non-potable water would not be used for any restaurant purposes.

Using the above assumptions, the non-potable demand would be 0.13 mgd under the Maximum Residential Scenario and 0.15 mgd under the Maximum Commercial Scenario, as summarized in Table 4.K.4. Under both scenarios, the non-potable demand could be met with greywater generated on site, and in both cases rain water could also be used to meet some of the non-potable demands.

Compliance with the requirements of the City's Non-potable Water Program would reduce the potable water demand to 0.38 mgd under the Maximum Residential Scenario and to 0.29 mgd under the Maximum Commercial Scenario, as summarized in Table 4.K.4.

Compliance with the Non-potable Water Program is a mandatory requirement for new construction. As a subdivision, the alternate water use requirements would apply equally to all proposed new buildings. Therefore, this water demand estimate presents the most likely water use scenario for both the Maximum Residential Scenario and Maximum Commercial Scenario.

Water Demands Once Off-Site Recycled Water from the City Is Available

As discussed on p. 4.K.21, the City plans to implement the Eastside Recycled Water Project by 2029. While this project would provide an off-site source of recycled water to the project site, the Proposed Project's non-potable water demand would already be met with an on-site alternate water supply such as greywater or stormwater in accordance with the City's Non-potable Water Program. However, there may still be landscaped areas that cannot be connected to the on-site alternate water supply; such areas would benefit from being connected to the City recycled water

system, when it is available. If such connections were necessary, approximately 0.006 mgd of recycled water could be required for open space irrigation under both scenarios, as shown in Table 4.K.4.[68]

Water Supply Assessment

On May 24, 2016, the SFPUC approved and adopted the Water Supply Assessment for the Proposed Project.[69] The Water Supply Assessment concludes that there are adequate potable water supplies in the regional water system to serve the total estimated maximum 0.51 mgd of water demand for the Proposed Project and cumulative demand during normal years, single dry years, and multiple dry years from 2015 through 2035. The Water Supply Assessment also indicates that the demand from the Proposed Project is accounted for within the overall San Francisco retail water demand being used for current water supply planning.

As confirmed by the SFPUC, existing potable water supplies serving the City would be sufficient to meet the Proposed Project's maximum total water demand, and the Proposed Project would not trigger the need for new or expanded water supply resources or entitlements. Further, compliance with San Francisco's Non-potable Water Program would reduce the Proposed Project's demand for potable water to less than that already approved under the Water Supply Assessment. Therefore, the Proposed Project's impacts on water supply would be less than significant, and no mitigation is necessary.

Impact UT-2: The Proposed Project would not require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. ***(Less than Significant)***

The Proposed Project includes the installation of distribution pipelines to supply the project site with potable water for on-site uses and firefighting as well as recycled water, once it is available through the City's Eastside Recycled Water Project. The AWSS would also be augmented as required to provide a supplemental source of non-potable water for firefighting. These proposed improvements are described in "Proposed Infrastructure and Utilities" in Chapter 2, Project Description, pp. 2.55-2.67, and further discussed below. With construction of these on-site improvements, the Proposed Project would not require the construction of additional new water treatment facilities or expansion of off-site existing facilities, the construction of which would cause significant environmental effects.

[68] BKF, *Pier 70 Water Demand Memorandum*.
[69] Public Utilities Commission, City and County of San Francisco, *Resolution No. 16-0095 approving May 24, 2016 Water Supply Assessment for the Pier 70 Project*, May 24, 2016.

Potable Water Distribution

Potable water to meet the site's potable water and fire flow demands would be supplied to the project site from the SFPUC's regional water system, via the in-City low-pressure water distribution system, described on pp. 4.K.8-4.K.9. As discussed in Impact UT-1, the SFPUC has determined in the Water Supply Assessment that the maximum estimated potable water demand for the Proposed Project is already accounted for within the overall San Francisco retail water demands, for which the associated regional water treatment and transmission facilities have been established. The Proposed Project would include the construction of new water distribution lines beneath existing and proposed public streets within the project site. These lines would connect to the City's 8-inch domestic water main beneath Illinois Street at 21st and 22nd streets, and to the 12-inch domestic water main beneath 20th Street, as indicated on Figure 2.19: Proposed Low-Pressure Water Distribution System, in Chapter 2, Project Description, p. 2.56. These improvements would be constructed by the project sponsors in accordance with the rules and regulations of the SFPUC, and subsequent individual development projects would connect to these new mains via service laterals constructed by the developers of the individual projects.

As discussed on p. 4.K.9, two fire hydrants were tested in November 2013. One was located on Illinois Street at 22nd Street, and the other was near the eastern end of 20th Street. The observed flow from the opened hydrants was 900 gpm with an 8 psi drop in pressure and 1,050 gpm with a 6 psi drop in pressure, respectively. The calculated fire flow rates are 2,029 and 3,195 gpm, respectively, when the minimum residual pressure is allowed to drop to 20 psi. The required flows for specific buildings would be further evaluated during subsequent phases of development, based on Appendix B of the California Fire Code, when the application for a new fire service connection is submitted to the SFPUC.

As part of the subdivision approval process, the project sponsors would be required to request the SFPUC to conduct a hydraulic analysis of the in-City low-pressure water distribution system to confirm that the existing and planned water distribution system is adequate to meet the potable water demands of the project, including fire flow demands. If the water distribution system is found to be inadequate to meet the Proposed Project's demand, the SFPUC would be responsible for construction of the required new water mains and appurtenances to ensure adequate water conveyance capacity.

AWSS Firefighting System

As described in "Proposed Infrastructure and Utilities" in Chapter 2, Project Description, pp. 2.55-2.67, the Proposed Project includes the installation of on-site AWSS high-pressure distribution piping beneath existing and proposed streets for the purposes of firefighting. These high-pressure pipelines would connect to the existing AWSS distribution pipeline in Third Street

and would supply fire hydrants within the project site. In addition, the AWSS may include a manifold near the shoreline that could be connected to a portable submersible pump for redundancy. The AWSS features would be designed in accordance with design criteria specified in Appendix B of the Subdivision Regulations, and the design would be subject to review and approval by the SFFD and the SFPUC. In accordance with the Subdivision Regulations, the SFFD would specify hydrant locations and spacing. Generally, the hydrants would be sited at street intersections.

Recycled Water System

The City does not maintain a recycled water system in the project area, and would not be able to provide recycled water until the Eastside Recycled Water Project is operational. However, because the project site is located within a designated recycled water use area,[70] as part of the Proposed Project the project sponsors would construct recycled water distribution lines beneath the existing and proposed streets within the project site, as shown on Figure 2.20: Proposed Recycled Water Distribution System, on p. 2.58. Once the City's Eastside Recycled Water Project is constructed (expected by the end of 2029), the Proposed Project's recycled water pipelines would be connected to the City's recycled water system. This system would deliver recycled water to the project site in place of potable water. The distribution pipelines would be constructed by the project sponsors in accordance with the rules and regulations of the SFPUC, and subsequent individual development projects would connect to these new mains via service laterals constructed by developers of subsequent individual development projects. No further environmental review would be required for construction of the service laterals.

Impact Conclusion

As discussed in Regulatory Framework on pp. 4.K.24-4.K.25, the tentative map prepared for the proposed subdivision must show the layout of all proposed underground utilities in accordance with the Subdivision Regulations. The map must also note any infrastructure improvements necessary to make the utility facilities operable, either on or off the site. Engineering documents, including grading plans and utility plans, must be submitted with the tentative map and must demonstrate compliance with the design criteria provided in Appendix B of the Subdivision Regulations. These submittals would be subject to review and approval by San Francisco Public Works, and ultimately subject to approval by the Board of Supervisors. For the construction of proposed public improvements, the Subdivision Regulations would require a Public Improvements Agreement between the developer and San Francisco Public Works if the

[70] SFPUC, *Recycled Water Us*e. Available online at http://www.sfwater.org/index.aspx?page=687. Accessed November 29, 2015.

improvements are not completed before the Final Map is recorded. City-approved Improvement Plans are required for all Public Improvement Agreements.

Implementation of these subdivision requirements would ensure that each water supply system is designed and constructed to accommodate projected water demands and fire flows in accordance with accepted City standards. Any off-site improvements needed to accommodate the Proposed Project's water demand would likely consist of upsizing off-site water mains or appurtenances, if required. Construction of these facilities would necessitate excavation, trenching, soil movement, and other activities typical of construction of development projects in San Francisco, and similar to those construction activities analyzed in this Environmental Impact Report (EIR).

Therefore, the Proposed Project would not require or result in the construction of new or expanded water treatment facilities that would cause significant environmental effects, and this impact would be less than significant. No mitigation is necessary.

Wastewater Facilities

Impact UT-3: The Proposed Project would not exceed wastewater treatment requirements of the Southeast Water Pollution Control Plant. ***(Less than Significant)***

Based on the estimated water demand for the Proposed Project, the project sponsors estimate that the increase in the average dry-weather wastewater flows under the Maximum Residential Scenario would be 0.48 mgd and average dry-weather wastewater flows under the Maximum Commercial Scenario would be 0.41 mgd at full build-out.[71] These estimates are based on using City-supplied recycled water for on-site non-potable uses. Both estimates assume that the sewer demand would be 95 percent of the indoor water potable water demand and 100 percent of the recycled water demand described above under Impact UT-1. The estimates also assume that 50 percent of the water used in cooling towers to cool the buildings would be discharge to the combined sewer system and that the irrigation demand would not contribute to the sewer demand.

Wastewater flows from the project site would be conveyed to the SEWPCP for treatment prior to discharge to San Francisco Bay. The SEWPC has a dry-weather capacity of 84.5 mgd, and the annual average wastewater flow to the SEWPCP during dry weather is 60 mgd.[72] Therefore, the SEWPCP has a remaining capacity of approximately 24.5 mgd, and the Proposed Project's average dry-weather wastewater demand of up to 0.48 mgd would be well within the remaining capacity of the SEWPCP. Therefore, impacts related to exceeding the wastewater treatment requirements of the SEWPCP would be less than significant, and no mitigation is necessary.

[71] BKF, *Pier 70 Sewer Demand Memorandum*, March 29, 2016 (hereinafter referred to as "*Pier 70 Sewer Demand Memorandum*").
[72] San Francisco Water Power Sewer, *San Francisco's Wastewater Treatment Facilities*, June 2014.

Water quality impacts associated with discharges to the City's combined sewer system are discussed in Impact HY-2 (see Section 4.O, Hydrology and Water Quality, pp. 4.O.54-4.O.64).

Impact UT-4: The Proposed Project would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Nor would the project result in a determination by the SFPUC that it has inadequate capacity to serve the project's projected demand in addition to its existing commitments. ***(Less than Significant)***

The project site is located within the 20th Street sub-basin of the City's combined sewer system. The 20th Street pump station conveys flows from the 20th Street sub-basin to the combined sewer system during both dry and wet weather. The pump station is designed to convey all dry-weather flows to the combined sewer system for treatment at the SEWPCP. During wet weather, the pump station and associated storage and detention pipes are designed to ensure that discharges from this sub-basin through the 20th and 22nd Street discharge structures do not exceed the long-term average of 10 CSDs per year as allowed under the Bayside NPDES permit.

Volumetric testing by the SFPUC in 2013 indicated that the 20th Street pump station dry-weather capacity is about 2.65 mgd with both pumps running.[73] In 2013, the average dry-weather wastewater flow rate to the pump station was 0.75 mgd at the time of the test and the peak flow rate was 1.5 mgd. Based on this, the SFPUC estimated that the pump station has a remaining capacity of about 1.2 mgd during dry weather.

The project sponsors estimate that the increase in the peak dry-weather wastewater flows would be 1.5 mgd under the Maximum Residential Scenario, and 1.3 mgd under the Maximum Commercial Scenario.[74] Both of these estimates assume that the sewer demand would be 95 percent of the indoor potable water demand and 100 percent of the recycled water demand described above under Impact UT-1; that 50 percent of the water used in the cooling towers to cool the buildings would be discharged to the sewer system; and that the irrigation demand would not contribute to the sewer demand.

The dry-weather sewer demand estimates for both the Maximum Residential Scenario and Maximum Commercial Scenario are greater than the remaining dry-weather capacity of the 20th Street pump station by approximately 0.3 and 0.1 mgd, respectively. To address this, the project sponsors would construct a new pump station to replace the 20th Street pump station, as described in "Common Improvements" in Chapter 2, Project Description, pp. 2.59-2.61. While portions of the existing force main that conveys wastewater flows to the combined sewer system could potentially be used under either proposed development scenario, this EIR conservatively assumes

[73] SFPUC, 20th Street Pump Station Technical Memorandum, p. 5.
[74] BKF, Pier 70 Sewer Demand Memorandum.

that the entire force main would be replaced. The need for replacement would be determined during final design. The 900-foot-long, 54-inch sewer line connecting the 20th and 22nd streets discharge structures would also be relocated to the east, beneath the proposed Waterfront Terrace and Waterfront Promenade. The 54-inch line provides storage of combined wastewater and stormwater during wet weather and is integral in controlling the number of combined sewer discharges from the 20th Street sub-basin during wet weather.

The new pump station and associated pipelines would be designed to accommodate both dry-weather and wet-weather flows from the existing 20th Street sub-basin, based on flows from the existing baseline, the Proposed Project at full build-out, and cumulative project contributions. The specific design criteria for the pump station would depend on the wastewater and stormwater management option selected (Combined Sewer System, Separated Systems, or Hybrid System), as discussed in Impact HY-2 in Section 4.O, Hydrology and Water Quality, pp. 4.O.54-4.O.64. However, in all cases, the performance standards require that the pump station be designed with a dry-weather capacity to accommodate all dry-weather flows and with a wet-weather capacity sufficient to ensure that potential wet-weather combined sewer discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average number of 10 combined sewer discharge events per year, as specified in the Bayside NPDES permit or applicable corresponding permit condition at time of final design. Impact HY-2 further discusses potential impacts associated with changes in wet-weather flows.

The conceptual description of the new pump station presented in Chapter 2, Project Description, is based on Wastewater and Stormwater Option 1 - Combined Sewer System, which includes use of the combined sewer system only. Under this option, all of the stormwater runoff from the project site would be discharged to the combined sewer system. Therefore, in terms of both physical size and capacity, this is the largest pump station that would be required under any of the three wastewater and stormwater management options because of the volume of stormwater discharged, and represents the worst case in terms of potential construction and operational impacts. The physical environmental impacts resulting from the construction and operation of the new pump station are addressed in other sections of this EIR, particularly Sections 4.D, Cultural Resources; 4.F, Noise and Vibration; 4.G, Air Quality; 4.H, Greenhouse Gas Emissions; 4.M, Biological Resources; 4.N, Geology and Soils; 4.O, Hydrology and Water Quality; 4.P, Hazards and Hazardous Materials; and 4.Q, Mineral and Energy Resources.

Water quality impacts related to operation of the new pump station are significant because of the potential to exceed the Bayside NPDES permit limitations during operation, as discussed Impact HY-2. These operational impacts would be reduced to a less-than-significant level with the implementation of Mitigation Measures M-HY-2a: Design and Construction of Proposed Pump Station for Options 1 and 3, or M-HY-2b: Design and Construction of Proposed Pump

Station for Option 2, pp. 4.O.60 and 4.O.61, respectively, depending on the stormwater management option selected. However, the impacts of constructing the new pump station are adequately addressed in this EIR. Therefore, this impact would be less than significant, and no mitigation is necessary.

Stormwater Facilities

Impact UT-5: The Proposed Project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. ***(Less than Significant)***

The Proposed Project includes three options for stormwater and wastewater management: Option 1, Combined Sewer System, which would utilize only the combined sewer system; Option 2, Separated Systems, which would utilize the combined sewer system for wastewater flows and a new separate storm drain system for storm runoff; and Option 3, Hybrid System, which would utilize both the combined sewer system and a new separate storm drain system for stormwater runoff. All of these options are described in "Wastewater and Stormwater Flow Options" in Chapter 2, Project Description, pp. 2.61-2.66.

Appendix B of the City's Subdivision Regulations specifies that both the combined sewer system and any separate stormwater system must have sufficient capacity to accommodate stormwater runoff from the entire tributary area that could result from a five-year storm (defined as a storm that has a 20 percent probability of occurring in any one year). Streets and drainage channels must be sized to accommodate excess surface flows from a 100-year storm (defined as a storm that has a 1 percent probability of occurring in any one year). The discussion below describes how each option would comply with these requirements and explains why this impact would be less than significant for each option.

Wastewater and Stormwater Option 1: Combined Sewer System

Under wastewater and stormwater Option 1, all stormwater flows would be conveyed to the combined sewer system under the jurisdiction of the SFPUC. The new components would be designed with sufficient capacity to accommodate stormwater runoff from a five-year storm and streets and drainage channels would be sized to accommodate excess surface flows from a 100-year storm. Further, in accordance with the SMRs, development projects implemented pursuant to the Proposed Project would be required to reduce the existing stormwater runoff flow rate and volume by 25 percent for a two-year 24-hour design storm if they are located on a site comprised of more than 50 percent impervious surfaces. If the project site is comprised of 50 percent or less impervious surfaces, the stormwater management approach must prevent the stormwater runoff flow rate and volume from exceeding existing conditions for the one- and two-year 24-hour

design storm. Alternatively, specific development activities could seek modified compliance with the SMRs, which would affect the amount of stormwater discharged to the combined sewer system. Potential methods for achieving the required reductions are discussed in Impact HY-2 (see Section 4.O, Hydrology and Water Quality).

As discussed in "Proposed Infrastructure and Utilities" in Chapter 2, Project Description, pp. 2.55-2.67 and Impact HY-2, the proposed 20th Street pump station would be designed with a wet-weather capacity sufficient to ensure that potential wet-weather combined sewer discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average of 10 CSDs per year as allowed under the Bayside NPDES permit or applicable corresponding permit condition at time of final design.

Wastewater and Stormwater Option 2: Separate Wastewater and Stormwater Systems

Under wastewater and stormwater Option 2, all of the stormwater runoff from the project site would be discharged to a new separate stormwater system that would be under the jurisdiction of the Port. The system would convey stormwater flows to a new outfall located near the foot of the new 21st Street. The new outfall would discharge stormwater to the Central Basin of Lower San Francisco Bay. The separate stormwater system would be designed with sufficient capacity to accommodate stormwater runoff from a five-year storm and streets and drainage channels would be sized to accommodate excess surface flows from a 100-year storm. As summarized in Impact HY-2, the City's SMRs would also require that development projects that discharge to the new separate stormwater system utilize a stormwater management approach that captures and treats runoff from an 85th percentile, 24-hour storm. Large Projects within the Hoedown Yard would be under SFPUC jurisdiction and must manage runoff from a 90th percentile, 24-hour storm. BMPs that would be used to meet these requirements are addressed in Impact HY-2.

Wastewater and Stormwater Option 3: Hybrid System

Under wastewater and stormwater Option 3, the combined sewer would continue to serve most of the project site. However, the area to the east of the proposed Maryland Street, including the proposed open space areas, would be served by a new separate stormwater system that would convey stormwater flows to a new outfall located near the foot of the new 21st Street. The new outfall would discharge stormwater to the Central Basin of Lower San Francisco Bay. All of the new stormwater drainage infrastructure would be designed with sufficient capacity to accommodate stormwater runoff from a five-year storm and streets and drainage channels would be sized to accommodate excess surface flows from a 100-year storm.

In the area served by the new separate stormwater system, flows diverted to San Francisco Bay would provide the 25 percent reduction in stormwater flows to the combined sewer system from

the 28-Acre Site. As discussed in Chapter 2, Project Description, and Impact HY-2, the new 20th Street pump station would be designed with a wet-weather capacity sufficient to ensure that potential wet-weather combined sewer discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average of 10 CSD events per year, as specified in the SFPUC Bayside NPDES permit or applicable corresponding permit condition at time of final design.

Impact Conclusion

As discussed above, the proposed stormwater infrastructure for both the combined sewer system and the separate stormwater systems would be constructed to accommodate a five-year storm and the streets and drainage channels would be sized to accommodate excess surface flows from a 100-year storm, in accordance with the City's Subdivision Regulations. The impacts of constructing this infrastructure under all three wastewater and stormwater options are addressed in other relevant sections of this EIR, particularly Sections 4.D, Cultural Resources; 4.F, Noise; 4.G, Air Quality; 4.H, Greenhouse Gas Emissions; 4.M, Biological Resources; 4.N, Geology and Soils; 4.O, Hydrology and Water Quality; 4.P, Hazards and Hazardous Materials; and 4.Q, Mineral and Energy Resources. Therefore, the Proposed Project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Therefore, this impact would be less than significant for all three wastewater and stormwater management options. No mitigation is necessary.

Solid Waste

Impact UT-6: The Proposed Project would be served by a landfill with sufficient capacity to accommodate the Proposed Project's solid waste disposal needs. ***(Less than Significant)***

The evaluation of solid waste includes the impacts associated with the construction and operation of the Proposed Project.

Construction Impacts

Construction of the Proposed Project would generate solid waste through the demolition and deconstruction of certain existing structures and infrastructure. Construction of the Proposed Project in phases is expected to take approximately 11 years to reach full build-out.

The buildings to be demolished or deconstructed are primarily composed of wood, metal, and concrete construction. To the extent practical, existing structures would be deconstructed, allowing for maximum reuse of materials for compliance with City regulations. The feasibility of reuse or recycling of materials may be limited by requirements for abatement of hazardous

materials, such as lead-based paint and asbestos, and by the potentially low value of the recycled material. In addition to the demolition and deconstruction of existing structures on the project site, certain existing pavements, underground utilities, and overhead utilities would be removed. Where possible, concrete and asphalt would be recycled or made available for use elsewhere on-site. Any contaminated soils and hazardous building materials located on-site would be appropriately disposed of in accordance with established Federal, State, and local laws and regulations as discussed in Section 4.P, Hazards and Hazardous Materials.

Under the San Francisco Construction and Demolition Debris Recovery Ordinance, no construction and demolition material may be taken to landfill or placed in the garbage. All mixed debris must be transported by a registered hauler to a registered facility to be processed for recycling. The Construction and Demolition Debris Recovery Ordinance also requires a minimum of 65 percent of all demolition debris to be recycled and diverted from landfills. The ordinance would also require preparation of a Demolition Debris Recovery Plan. Moreover, the 2013 Green Building Ordinance would require that at least 75 percent of the Proposed Project's construction debris is diverted from the landfill. Compliance with these requirements is mandatory and enforced by the DBI.[75] Given compliance with these mandatory diversion requirements, the impact of construction-related solid waste would be less than significant.

Operational Impacts

According to CalRecycle, San Francisco residents generate approximately 3.3 pounds of solid waste for disposal in a landfill per resident per day, while commercial uses generate approximately 4.4 pounds for disposal in a landfill per employee per day.[76] Under existing conditions, the project site generates approximately 400 tons of solid waste for disposal per year.

Maximum Residential Scenario

The Proposed Project would generate solid waste for landfill disposal, recyclables, and compostables. Solid waste for landfill disposal is the focus of the impact analysis. Table 4.K.5: Estimated Solid Waste Generation for Landfill Disposal under the Maximum Residential Scenario, presents estimated solid waste generation for the Maximum Residential Scenario at full build-out. The 28-Acre Site would generate approximately 6,400 tons per year of solid waste, and the Illinois Parcels would produce approximately 1,350 tons per year. The total of

[75] San Francisco Department of Building Inspection, Green Building Ordinance (web page). Available online at http://sfdbi.org/green-building-ordinance. Accessed January 8, 2016.

[76] CalRecycle, Jurisdiction Diversion/Disposal Rate Detail (web page) (for San Francisco 2014 data). Available online at http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionDetail.aspx?JurisdictionID=438&Year=2014. Accessed January 9, 2016.

approximately 7,750 tons per year would be approximately 1.6 percent of the total quantity of solid waste generated in 2014 by the City as a whole (498,428 tons). [77]

Table 4.K.5: Estimated Solid Waste Generation for Landfill Disposal under the Maximum Residential Scenario

Site	Persons	Solid Waste Generation (tons/year)
28-Acre Site		
Population	4,881	2,900[1]
Employment	5,443	3,500[2,3]
Subtotal	***10,324***	***6,400***
Illinois Parcels		
Population	1,987	1,200[1]
Employment	156	150[2,3]
Subtotal	***2,143***	***1,350***
TOTAL		**7,750**

Notes:
[1] The solid waste generation factor for residents is 3.3 pounds per day per person.
[2] The solid waste generation factor for employees is 4.4 pounds per person per day.
[3] Commercial-Office space is calculated at 260 work-days per year; for all other types of employees, 365 day per year of operation is assumed.

Source: SWCA 2016

Maximum Commercial Scenario

Table 4.K.6: Estimated Solid Waste Generation for Landfill Disposal under the Maximum Commercial Scenario, presents estimated solid waste generation for the Maximum Commercial Scenario at full build-out. The 28-Acre Site would generate approximately 7,000 tons per year of solid waste, and the Illinois Parcels would produce approximately 1,350 tons per year. The total of approximately 8,350 tons per year would be approximately 1.7 percent of the total quantity of solid waste generated in 2014 by the City as a whole (498,428 tons).

Diversion Strategies under Both the Maximum Residential and Maximum Commercial Scenarios

The City has implemented a number of aggressive strategies to divert additional solid waste and achieve Citywide diversion goals as described in "San Francisco's Solid Waste Reduction Efforts," in Regulatory Setting, pp. 4.K.14-4.K.15. The City requires residents and businesses to pre-sort recyclables, compostable wastes (food scraps and yard waste), and garbage into separate curbside collection containers. The City sponsors regular public outreach events to educate San

[77] CalRecycle, "Jurisdiction Diversion/Disposal Rate Detail" (web page) (for San Francisco 2014 data). Available online at http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionDetail.aspx?JurisdictionID=438&Year=2014. Accessed January 9, 2016.

Table 4.K.6: Estimated Solid Waste Generation for Landfill Disposal under the Maximum Commercial Scenario

Site	Persons	Solid Waste Generation (tons/year)
28-Acre Site		
Population	2,497	1,500[1]
Employment	8,754	5,500[2,3]
Subtotal	***11,251***	***7,000***
20th/Illinois Parcels		
Population	1,238	750[1]
Employment	1,014	600[2,3]
Subtotal	***2,252***	***1,350***
TOTAL		**8,350**

Notes:

[1] The solid waste generation factor for residents is 3.3 pounds per day per person.

[2] The solid waste generation factor for employees is 4.4 pounds per person per day.

[3] Commercial-Office space is calculated at 260 work-days per year; for all other types of employees, 365 day per year of operation assumed.

Source: SWCA 2016

Francisco residents and businesses about waste diversion techniques, and conducts special collection events for wastes that are not generally recyclable at curbside (e.g., batteries, electronics, hazardous wastes). For municipal operations, City departments participate in a sustainable purchasing program that encourages the purchase of recyclable materials. The City also sponsors grants for waste diversion research and works with businesses to create market opportunities for materials reuse and recapture. Local waste management providers have upgraded sorting and transfer facilities to maximize the volume of material diverted.

The City's contribution to landfills is anticipated to diminish over time as it implements more aggressive waste-diversion strategies. Increasing solid waste diversions would extend the life of the landfills used by the City, lengthening the time horizon before the remaining disposal capacity is filled.

Although the Proposed Project would incrementally increase total waste generation from the City by increasing population and employment, the increasing rate of diversion through recycling and other methods implemented under the City's regulations would likely result in a decreasing share of total waste that requires deposition into the landfill.

In September 2015, the City approved an Agreement with Recology, Inc., for the transport and disposal of the City's municipal solid waste at the Recology Hay Road Landfill in Solano County. That Agreement is anticipated to extend for approximately nine years from 2016, with an option to renew the Agreement thereafter for an additional six years. The Recology Hay Road Landfill is permitted to accept up to 2,400 tons per day of solid waste. As of 2013, Recology estimated the landfill had capacity to accommodate solid waste until approximately 2077.[78] The remaining capacity as of 2010 was 30,433,000 cubic yards.[79]

Given the City's record of reducing its municipal waste sent to the landfill, and given the near-term and the long-term capacity available at the Recology Hay Road Landfill, the solid waste from the Proposed Project would not result in the landfill exceeding its permitted capacity, and the Proposed Project would result in a less-than-significant solid waste generation impact. No mitigation is required.

Impact UT-7: The Proposed Project would not fail to comply with Federal, State, and local statutes and regulations related to solid waste. ***(No Impact)***

As discussed above, during project construction, the project sponsors would be required to comply with the City's Construction and Demolition Debris Recovery Ordinance and Green Building Ordinance.

During operation, the Proposed Project would be required to comply with the laws and regulations that aim to divert waste from landfills, including but not limited to, the Green Building Ordinance, Mandatory Recycling & Composting Ordinance, Plastic Bag Reduction Ordinance, and Food Service Waste Reduction Ordinance.

The Proposed Project would comply with local solid waste ordinances, and would comply with State standards for reducing solid waste. Because State and local laws and regulations are more stringent than Federal standards, State and local laws are the primary driver for the reduction in solid waste. There would be no impact regarding compliance with solid waste laws and regulations. No mitigation measures are required.

[78] California Department of Resources Recycling and Recovery (CalRecycle), Facility/Site Summary Details: Recology Hay Road (48-AA-0002). Available online at http://www.calrecycle.ca.gov/SWFacilities/Directory/48-AA-0002/Detail/ (with link to permit). Accessed January 9, 2016.

[79] Ibid. (see permit).

Cumulative Impacts

Impact C-UT-1: The Proposed Project, in combination with other past, present, and reasonably foreseeable future projects, would not result in significant adverse cumulative utilities and service systems impacts. ***(Less than Significant)***

The geographic context for impacts to utilities and service systems encompasses the service areas for the applicable service providers. The Proposed Project, when combined with past, present, and reasonably foreseeable future development, would increase demand for water, wastewater, and solid waste disposal services of these providers and the cumulative impacts related to these increases are discussed below.

Water Supply

As described in Impact UT-1, the SFPUC has approved and adopted a Water Supply Assessment for the Proposed Project, concluding that there are adequate potable water supplies in the regional water system to serve the total estimated maximum 0.51 mgd of water demand for the Proposed Project and cumulative demand during normal years, single dry years, and multiple dry years from 2015 through 2035.[80] The Water Supply Assessment also indicates that the demand from the Proposed Project is accounted for within the overall San Francisco retail water demand being used for current water supply planning. Therefore, the cumulative impacts on water supply would be less than significant, and no mitigation is necessary.

Wastewater Facilities

As discussed above in Impact UT-3, the peak wastewater flows under both the Maximum Residential Scenario and Maximum Commercial Scenario in combination with existing wastewater flows would exceed the 2.65 mgd capacity of the existing 20th Street pump station. To address this, the project sponsors propose to construct a new 20th Street pump station and potentially replace the associated force main to convey flows to the City's combined sewer system. The project sponsors would design the new pump station and associated force main to accommodate both dry-weather and wet-weather flows from the 20th Street sub-basin, including existing flows, the Proposed Project at full build out, and cumulative project contributions from other areas within the sub-basin, including the BAE Systems area to the north of 20th Street and the 20th Street Historic Core site.

However, the SFPUC and San Francisco Public Works have evaluated the current capacity of the existing combined sewer system downstream of the 20th Street sub-basin and determined that

[80] SFPUC, City and County of San Francisco, *Resolution No. 16-0095 approving May 24, 2016 Water Supply Assessment for the Pier 70 Project*, May 24, 2016.

additional capacity is needed to convey the estimated future cumulative flows (including those from the Proposed Project at full build-out) from the existing Marin Street sewer to the Islais Creek storage and transport structure. The Marin Street sewer collects drainage from several areas including Mission Bay South, Potrero Hill, and Piers 70 and 80.[81]

To increase the conveyance capacity, the SFPUC will construct the Kansas and Marin Streets Sewer Improvements Project and Marin Street Sewer Replacement Project under the Sewer System Improvement Program.[82] The Kansas and Marin Streets Sewer Improvements Project will construct a 360-foot-long auxiliary sewer to connect the Marin Street sewer to the Islais Creek storage and transport structure. The Marin Street Sewer Replacement Project involves replacing about 1,800 feet of the existing 24-inch Marin Street sewer line from Third Street westward to the Marin Outfall at Islais Creek with a 30-inch sewer line.

As the owner and operator of the combined sewer system, the SFPUC is responsible for constructing these projects. Engineering, planning, and design of this project are underway and the City has prepared documentation for Categorical Exemptions under CEQA.[83,84] The projects are approved and funded, and construction is scheduled to be completed by the end of 2018, prior to implementation of the Proposed Project.

With construction of these approved and funded projects by the SFPUC, cumulative impacts related to exceeding the capacity of the combined sewer system would be less than significant. SFPUC's review of future cumulative flows did not identify any other needed improvements to convey cumulative wastewater flows to the SEWPCP.

Stormwater Facilities

As discussed in Impact UT-5, the project site would be served by new stormwater infrastructure to be constructed as part of the Proposed Project. While the Proposed Project includes three options for stormwater and wastewater management (Option 1, Combined Sewer System; Option 2, Separated Systems; and Option 3, Hybrid System), the stormwater infrastructure constructed under each option must have sufficient capacity to accommodate stormwater runoff from the project site in accordance with San Francisco's Subdivision Regulations. In addition, streets and drainage channels would be sized to accommodate excess surface flows from a 100-year storm. Under Options 2 and 3, the project site would comprise the entire tributary area for

[81] Email from Molly Petrick, San Francisco Public Utilities Commission, to Kelly Pretzer, Forest City Enterprises and Craig Freeman, San Francisco Public Utilities Commission *re Pier 70 SUD – Phased Water/Sewer Demands*, October 2, 2015.
[82] San Francisco Public Utilities Commission, Quarterly Report, Wastewater Enterprise Programs, October 2015 – December 2015, February 16, 2016, p. A-8.
[83] Environmental Case No. 2015-005036ENV.
[84] Environmental Case No. 2016-011325ENV.

the Proposed Project's separate storm drainage system, so there would be no cumulative impact related to storm drainage capacity. Under Options 1 and 3, the new 20th Street pump station that would convey stormwater flows to the combined sewer system would be designed to accommodate both dry-weather and wet-weather flows from the existing 20th Street sub-basin, based on flows from the existing baseline, the Proposed Project at full build-out, and cumulative project contributions, without causing an increase in combined sewer discharges into the combined sewer system. Therefore, the Proposed Project when combined with other reasonably forseeable projects would not result in cumulative impacts that require the construction of new stormwater drainage facilities nor require the expansion of existing facilities. This cumulative impact would be less than significant, and no mitigation is necessary.

Solid Waste

The City and County of San Francisco currently exceeds Statewide goals for reducing solid waste, and is expected to further reduce solid waste volumes in the future. The operation of the Proposed Project would not contribute considerably to significant regional impacts on landfill capacity, because it would comply with City and County of San Francisco requirements to reduce solid waste, as would other development projects that would also contribute waste to the City's landfills. The construction of other cumulative projects identified for this EIR would generate construction waste during their construction periods. However, the Proposed Project's program of construction waste diversion and compliance with regulatory requirements, along with the cumulative projects' compliance with regulatory requirements, would reduce their contribution to overall solid waste volumes such that the contribution would not be considerable, and the Proposed Project in combination with the cumulative projects would not have a significant cumulative impact.

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L. PUBLIC SERVICES

Section 4.L, Public Services, discusses the topics of police protection, fire protection and emergency medical services, public school facilities, and public libraries. The Environmental Setting discussion describes the existing baseline conditions for these public services. The Impacts and Mitigation Measures discussion addresses the changes in demand for these services and facilities that would occur if the Proposed Project is implemented, and whether new or expanded services would be needed as a result. The Impacts discussion also considers whether the Proposed Project in combination with other reasonably foreseeable development projects would contribute to cumulative environmental impacts related to public services.

Data used in this section include written reports and interviews/survey responses obtained from the San Francisco Police Department (SFPD) and the San Francisco Fire Department (SFFD), and reports from the San Francisco Unified School District (SFUSD), the San Francisco Public Library, and the City Controller.

The topic of public recreation and park facilities serving the project site is discussed in Section 4.J, Recreation, pp. 4.J.1-4.J.15.

ENVIRONMENTAL SETTING

POLICE

The SFPD, headquartered in the Public Safety Building at 1245 Third Street, provides public safety services in the City and County of San Francisco. SFPD services include responding to calls for police assistance, monitoring and managing traffic, and performing general surveillance duties. The SFPD consists of the Golden Gate and Metro divisions and the Operations, Special Operations, and Administration bureaus. The Golden Gate and Metro divisions contain ten separate districts that cover the City.

Staffing

The SFPD does not have an adopted standard for the ratio of officers to population or developed acreage, and bases its staffing levels on the number of service calls and crime incidents. In 2014, the SFPD averaged approximately 1,691 sworn officers out of a total of approximately

1,971 authorized sworn positions.[1,2] Recent lower staffing levels are due to retirements. In 2012, the SFPD initiated a six-year hiring plan to gradually increase the number of SFPD officers (with an average of 50 new hires per year planned from three recruit academies). The staffing-level goal is expected to be reached in mid-2018.[3]

Police Response

Citywide

The type of police response varies according to the nature and urgency of the call. The SFPD has established the following four call priorities:

- Priority A – Calls involving a life-threatening emergency. These calls are the highest priority.
- Priority B – Calls involving potential for harm to life and/or property. These calls are the second highest priority.
- Priority C – Calls involving crime committed with no threat to life or property, and the suspect has left the crime scene. These calls are third highest priority.
- Priority I – Calls that are information only broadcast, e.g., public disturbance. The caller wants to remain anonymous.[4]

In 2013, the violent and property crime rates in the City were 9.63 and 55.92 incidents per 1,000 residents, respectively. The average Citywide crime rate was 65.54 incidents per 1,000 residents. Violent crime increased by 11 percent and property crime increased by 13 percent compared to 2012 rates.[5]

Project Site

The project site is within the SFPD's Bayview Police District, which is part of the Metro Division and headquartered at 201 Williams Avenue, approximately 2 miles south of the project site. (See

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1 San Francisco City Charter Section 4.127 states that the City is to maintain a staffing level of a minimum of 1,971 sworn officers, excluding officers at San Francisco International Airport, and officers not available for field duty (e.g., due to on-duty injuries, temporary modified duty, medical leave, and administrative leave).

2 San Francisco Police Department (SFPD), *Annual Report 2014*, p. 34. Available online at https://www.dropbox.com/s/mpfjb7eoy54vsrb/2014%20Annual%20Report.pdf?dl=0. Accessed December 2, 2015. The 2014 SFPD Annual Report is the most recent data source.

3 SFPD, *Annual Report 2014*, p. 34.

4 San Francisco Legislative Analyst, Crime Report Systems (File No. 031412), February 24, 2004. Available online at http://sfbos.org/crime-reporting-systems-file-no-031412. Accessed September 26, 2016.

5 SFPD, CompStat, December 2013. Available online at http://www.sf-police.org/Modules/ShowDocument.aspx?documentid=27342. Accessed September 22, 2015.

Figure 4.L.1: Police Stations, Fire Stations, Schools, and Libraries in the Project Vicinity.) By area served, the Bayview Police District is the largest of the City's ten police districts (approximately 20 percent of the land mass in the City), and covers the southeastern part of the City, extending along the eastern edge of McClaren Park to San Francisco Bay and south from Channel Street to the San Mateo County line.[6] It includes the Dogpatch, Potrero Hill, Bayview, Silver Terrace, Portola, and Hunters Point neighborhoods. The Bayview Police District has a population of approximately 80,000 people and covers an area with predominantly mixed-use commercial and residential developments.

Personnel include district command staff, administrative officers, and patrol officers. SFPD officers from this police district respond to calls on the project site. Currently, the Port of San Francisco contracts with the SFPD to provide two additional officers who respond to the calls for service at the project site.[7]

In 2013, the Bayview Police District received 983 calls for crimes against persons and 3,373 calls for property crimes, for a total of 4,356 calls.[8] From 2008 to 2013, the district handled 8.7 percent of all Citywide calls and 9.9 percent of the incidents.[9]

In 2013, the reported Bayview Police District violent and property crime rates were 12.41 and 42.97 incidents per 1,000 residents, respectively. The violent crime rate is slightly higher than the Citywide average and the property crime rate is lower. The average reported crime rate for the district is about 55.39 incidents per 1,000 residents per month.[10] Compared to 2012, the Bayview Police District reported violent crime and property crime rates were higher by 8 and 10 percent, respectively.[11] The recent reported increase in crime in the Bayview Police District is similar to the rise Citywide.

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6 SFPD, *Annual Report 2014*, p. 65.

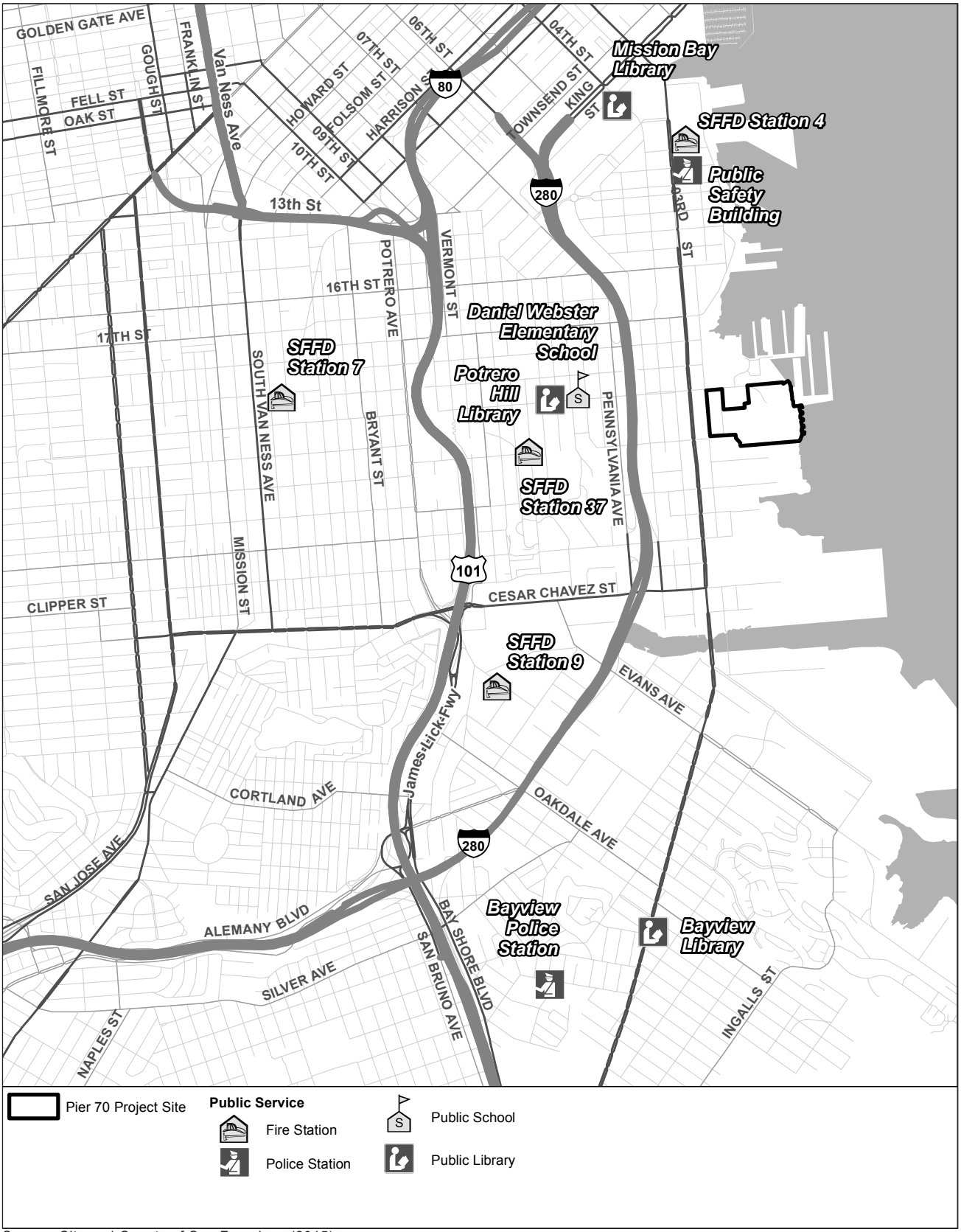
7 City and County of San Francisco, *Pier 70 Waterfront Site and Illinois Street Parcel Development Projects Findings of Fiscal Responsibility*, May 21, 2013, p. 28.

8 SFPD, *Annual Report 2013*, pp. 102-103. Available online at https://dl.dropboxusercontent.com/u/76892345/Annual%20Reports/2013%20Annual%20Report.pdf. Accessed December 2, 2015.

9 City and County of San Francisco – Controller's Office, *District Station Boundary Analysis Report*, March 3, 2015 (hereinafter referred to as "*Boundary Analysis Report*"), p. 27. Available online at http://sfcontroller.org/Modules/ShowDocument.aspx?documentid=6273. Accessed September 14, 2015.

10 SFPD, CompStat, December 2013. Available online at http://www.sf-police.org/Modules/ShowDocument.aspx?documentid=27342. Accessed September 22, 2015.

11 SFPD, CompStat, December 2013. Available online at http://www.sf-police.org/Modules/ShowDocument.aspx?documentid=27342. Accessed September 22, 2015.



Source: City and County of San Francisco (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.L.1: POLICE STATIONS, FIRE STATIONS, SCHOOLS, AND LIBRARIES IN THE PROJECT VICINITY

In 2015, the SFPD released the *District Station Boundary Analysis*, which analyzes police district boundary lines in the City.[12] This analysis was undertaken for reasons that include the construction of the new Southern District Police Station, located within the footprint of the current Bayview Police District; anticipated residential, commercial, and transportation developments that would affect the eastern and southern areas of the City; and an imbalanced workload among police districts and sectors due to varying demands for service within the patrol division.[13] As a result of the *District Station Boundary Analysis*, the Bayview Police District's proposed service area will be reduced in order to keep the new Southern District station within the Southern District boundary. The proposed line changes would result in a reduction in demand for Bayview Police District resources.[14]

FIRE AND EMERGENCY MEDICAL SERVICES

The SFFD, headquartered at 698 Second Street, is responsible for protecting life and property throughout San Francisco from fires, natural disasters, and hazardous materials incidents.[15] The SFFD also provides emergency medical services and transport in the City, including basic life support (BLS) and advanced life support (ALS) services. It is made up of six divisions: Administration, Fire Investigation, Operations (Fire Suppression and Emergency Medical Services), Fire Prevention, Support Services, and Training. In addition, several privately operated ambulance companies are authorized to provide BLS and ALS services within the City.

SFFD firefighting companies are organized into three divisions: the Airport Division, which serves San Francisco International Airport,[16] and Divisions 2 and 3, which serve the rest of San Francisco. Division 2 is divided into four battalions (Battalions 1, 4, 7, and 8) and extends from downtown San Francisco and the Financial District to the City's northwestern boundaries. Division 3 is divided into five battalions (Battalions 2, 3, 6, 9, and 10) that serve an area extending from Market Street to the southeastern City limits. Division 2 and 3 staff responsibilities include establishing command and control at emergency scenes; conducting fire suppression activities; providing emergency medical services; managing disaster operations; mitigating the effects of hazardous materials spills; responding to incidents involving weapons of mass destruction; and bringing closure to mass-casualty incidents effectively and rapidly. Their fire prevention responsibilities include planning and inspecting buildings, fire protection devices, and water supplies used for firefighting. The SFFD ensures fire safety and emergency

[12] City and County of San Francisco – Controller's Office, *Boundary Analysis Report*, p. 1.
[13] City and County of San Francisco – Controller's Office, *Boundary Analysis Report*, p. 27.
[14] City and County of San Francisco – Controller's Office, *Boundary Analysis Report*, pp. 4-5.
[15] San Francisco Fire Department, Annual Report: FY 2012-2013, p. 3. Available online at http://www.sf-fire.org/modules/showdocument.aspx?documentid=3584. Accessed September 14, 2015.
[16] The Airport Division is composed of three firefighting companies located at San Francisco International Airport.

accessibility in new and existing developments by reviewing plans and inspecting buildings to determine their compliance with provisions of the building and fire codes.[17]

Staffing

As of 2013, the SFFD has approximately 1,392 uniformed and 57 civilian members.[18,19] The U.S. Census Bureau's 2013 American Community Survey estimates that the City's total population is 817,501 residents.[20] Therefore, the ratio of uniformed fire personnel to residents is approximately 1.7 to 1,000 persons. Although the SFFD does not have a fire-personnel-to-residents ratio goal, the existing ratio is used as a baseline for comparison. The SFFD has 43 engine companies, 19 truck companies, 43 dynamically deployed ambulances,[21] 2 heavy rescue squad units, 2 fireboats, and 19 special purpose units. There are currently 44 permanently staffed fire stations located strategically throughout the City, 3 stations at San Francisco International Airport, and 1 station, Fire Station 49, that houses emergency vehicles and supplies. Although the SFFD system has evolved over the years to respond to the City's changing needs, the current station configuration has not changed substantially since the 1970s.[22]

Staffing at each station is based on the station's types of firefighting equipment. Based on the Memorandum of Understanding between the City and County of San Francisco and the San Francisco Fire Fighters Union Local 798, engines[23] are staffed with one officer and three firefighters, all of whom are trained emergency medical technicians (EMTs); rescue squads are

[17] San Francisco Fire Department, About SFFD Operations. Available online at http://www.sf-fire.org/index.aspx?page=164. Accessed September 14, 2015.

[18] San Francisco Fire Department, Annual Report: FY 2012-2013, p. 8. Available online at http://www.sf-fire.org/modules/showdocument.aspx?documentid=3584. Accessed September 14, 2015.

[19] The 2012-2013 SFFD Annual Report is the most recent data source.

[20] U.S. Census Bureau, 2009-2013 5-Year American Community Survey, San Francisco County, American Community Survey Demographic and Housing Estimates. Available online at http://factfinder.census.gov/rest/dnldController/deliver?_ts=461008993623. Accessed September 22, 2015.

[21] The San Francisco Administrative Code requires that the SFFD maintain four ambulances "statically deployed" at fire stations. In 2009 the SFFD completed conversion to a "dynamic" deployment model designed to enhance scheduling, increase efficiency, and improve response times by stationing four ambulances at locations throughout the City rather than at "static" fixed locations. Dynamic deployment refers to the ambulance dispatch strategy of estimating demands and stationing ambulances accordingly to increase their mobility and ensure the fastest response times. Since 2009, all City ambulances have been dynamically deployed out of Fire Station 49, located at 1415 Evans Avenue at Mendell Street in the southwestern portion of the City.

[22] San Francisco Fire Department, Annual Report: FY 2012-2013, p. 8.

[23] Engines carry water and hose to extinguish fires, as well as medical equipment and defibrillators. They are the first responders to Code 3 medical calls. An engine can be an ALS or BLS engine depending on the availability of a paramedic. If a firefighter/paramedic is not available, the position is taken by a firefighter EMT.

staffed with one officer and three firefighters; and trucks[24] are staffed with one officer (lieutenant or captain) and four firefighters.[25] On an ALS engine, one of the firefighters is a firefighter/paramedic, with a significantly higher level of medical training than an EMT. Ambulances are staffed with an EMT and a paramedic who provide pre-hospital advanced medical and trauma care. The number of engines, trucks, and ambulances on duty at any time is based on staffing availability.

Fire and Emergency Medical Response

Citywide

The SFFD's response system includes provisions for the department to handle multiple, simultaneous emergencies within a primary response area.[26] Incident calls and responses are coded, and the SFFD has a protocol and order in which stations are called to respond, depending on the type of incident and whether vehicles or equipment are in use at another location.[27]

The SFFD responds to two types of calls. Code 2 calls are non-life-threatening fire and medical emergencies, and Code 3 calls are life-threatening fire and medical emergencies, the highest response priority. When responding to Code 3 calls, responding vehicles use flashing lights and sirens and cross intersections against control lights. Responses to Code 2 calls are dispatched without lights and sirens. In San Francisco, response times are calculated from the time the dispatch is received and acknowledged at the station to the time the responding unit informs dispatch that it is at the scene.

The National Fire Protection Association (NFPA) has established time standards for fire and medical responses. NFPA Standard 1710 defines response time goals for various stages of response to an emergency incident. The time standard for fire and medical responses is defined as the turn-out time (the time from acknowledgement of a call to beginning of travel) plus travel time. While NFPA Standard 1710 is not a legal requirement, it provides a standardized guideline

[24] Trucks carry ladders and other equipment and are used in fire suppression to provide ladder access, rescue, and ventilation.

[25] Memorandum of Understanding between the City and County of San Francisco and San Francisco Fire Fighters Union Local 798, International Association of Fire Fighters, American Federation of Labor-Congress of Industrial Organizations, July 1, 2007 to June 30, 2018, Unit 1, Revised per Amendment #6, p. 29. Available online at http://sfdhr.org/index.aspx?page=54. Accessed September 22, 2015.

[26] Each fire station has an area of responsibility (or primary response area) for which it is typically the first responder to emergency calls. This means that the assigned fire station and its personnel and firefighting apparatus (unless out on another call) will be dispatched first to a call within their primary response area. These primary response areas have been designed so as to optimize response times.

[27] An incident is a specific event to which one or more fire stations or fire vehicles respond. Responses include each vehicle that is dispatched to the incident. Therefore, for one incident (depending on type), there could be two or more responses.

followed by many cities across the country, including San Francisco. The NFPA standards are as follows:

- For fire incident responses: 5 minutes for first engine on the scene with a turnout time of up to 80 seconds plus travel time of 4 minutes or less.
- For emergency medical responses:
  - BLS services: 5 minutes with a turnout time of 60 seconds plus travel time of 4 minutes or less.
  - ALS services: 8 minutes with a turnout time of 60 seconds plus travel time of 8 minutes or less.

The SFFD target response time goal is 20 minutes for Code 2 calls 90 percent of the time. For Code 3 calls the SFFD target response time goal is 4 minutes and 30 seconds 90 percent of the time for first responders capable of performing BLS, 7 minutes 90 percent of the time for responders capable of performing ALS, and 10 minutes for an ambulance to arrive on the scene.[28] The average response time throughout the City for Code 3 calls is 4 minutes and 40 seconds, indicating that SFFD is meeting its target response goals for first responders on scene.[29] However, the SFFD is currently not meeting the average or 90th percentile standard[30] for ambulance transport (i.e., ambulances arriving on scene).[31] In August 2014, the City formed an Ambulance Working Group, headed by the Mayor's Office, with representatives from the SFFD, the Department of Emergency Management, the City Controller, the Board of Supervisors, the Fire Commission, and other relevant stakeholders. The working group was tasked with analyzing the issues facing the City's Emergency Medical Services (EMS) system and developing recommendations to meet response times, among other goals. Recommendations identified by the Ambulance Working Group have been implemented, including augmenting staffing and the number of ambulances in the fleet, and response times have improved. The average response times for ambulance transport in response to Code 3 calls have decreased from 8.26 minutes to

[28] San Francisco Department of Emergency Management, San Francisco EMS Agency Policy Manual, Section 4: Response and Transportation, Policy Reference No. 4000, November 1, 2015, pp. 5-8. Available online at http://www.sfdem.org/index.aspx?page=165. Accessed November 25, 2015.

[29] Fire Commission Response to Grand Jury Report, August 12, 2004. Available online at http://www.sf-fire.org/index.aspx?page=827. Accessed September 14, 2015.

[30] "90th percentile" means that in nine out of ten responses, the responding vehicle arrives within the required time. This is a national statistical methodology utilized by Emergency Response Agencies to measure and compare emergency response times.

[31] City and County of San Francisco Civil Grand Jury Report, 2014-2015, San Francisco Fire Department *What Does the Future Hold?*, June 2015, p. 9. Available online at http://civilgrandjury.sfgov.org/2014_2015/14-15_CGJ_Report_SFFD_What_Does_the_Future_Hold_%207_16_15v2.pdf. Accessed November 25, 2015.

6.72 minutes, while the 90th percentile response times have decreased from 14.63 minutes to 10.82 minutes (the City's goal for Code 3 ambulance transport is 10 minutes).[32]

Between July 1, 2012 and June 30, 2013, the SFFD received 120,536 calls for service within the City. Of these incidents, the majority (77 percent, or 92,255 calls) required a response by EMS personnel and 23 percent (or 28,281 calls) required a response by fire personnel.[33] Because EMS calls make up the majority of all calls, most of the work of the SFFD's Fire Suppression Division consists of emergency medical response.

Project Site

The project site is located within the SFFD's Division 3 service area, which extends from approximately Market Street to the southeastern border of the City. San Francisco International Airport, Treasure Island/Yerba Buena Island, and the Hunters Point Naval Shipyard also fall within its operational jurisdiction. The Division 3 service area encompasses all types of residential and commercial buildings, including high-rise buildings, underground construction, wood-frame residential structures in densely populated neighborhoods, and the City's only heavy concentration of industrial uses. In addition, the responsibilities of Division 3 include the main transportation facilities in the City (BART [Bay Area Rapid Transit], San Francisco International Airport, Muni) and an extended area of Port of San Francisco facilities. The oversight of these areas requires SFFD staff to have a wide variety of specialized training with the agencies that oversee these facilities. The Port of San Francisco Fire Marshal is the SFFD's liaison to the Port and conducts construction and referral inspections, plan review, and pier surveys, as well as issuing permits along the Port's 7.5 miles of waterfront jurisdiction.[34]

The project site is within Battalion 10 and in the first response area for Fire Station No. 37.[35] Fire Station No. 37 is located in the Potrero Hill neighborhood at 798 Wisconsin Street, approximately 0.75 mile west of the project site. It houses one engine company (designated as a BLS engine company) and is staffed by one officer and three firefighters, all of whom are EMT qualified.[36] In addition to Fire Station No. 37, Battalion 10 includes the following fire stations:

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[32] Ibid and Office of the Mayor, Memorandum to Mayor Lee from Kate Howard, Mayor's Budget Director, re: Ambulance Working Group Conclusion, February 23, 2015. Available online at http://civilgrandjury.sfgov.org/2014_2015/14-15_CGJ_Report_SFFD_What_Does_the_Future_Hold_%207_16_15v2.pdf. Accessed November 25, 2015.

[33] San Francisco Fire Department, Annual Report: FY 2012-2013, p. 6. Available online at http://www.sf-fire.org/modules/showdocument.aspx?documentid=3584. Accessed September 14, 2015.

[34] City and County of San Francisco Fire Department, About Division. Available online at http://sf-fire.org/about-division. Accessed September 14, 2015.

[35] The first alarm area is the geographic area in which a station is responsible for arriving first in case of an emergency call.

[36] E-mail communication with Rhab Boughn, Public Records Officer, SFFD, October 27, 2015.

- Fire Station No. 4, at 449 Mission Rock Street at Third Street, approximately 1.5 miles north of the project site. Fire Station No. 4 became operational in April 2015 and is located in the newly constructed Public Safety Building in Mission Bay. The station houses one engine company (designated as an ALS engine company) and one truck company, and is staffed by nine personnel per shift, all of whom are EMT qualified.
- Fire Station No. 9, at 2245 Jerrold Avenue at Upton Street, approximately 2 miles southwest of the project site. The station houses one engine company (designated as an ALS engine company) and one truck company, and is staffed by 10 personnel per shift, including a firefighter/paramedic and a Battalion Chief.
- Fire Station No. 17, at 1295 Shafter Avenue at Ingalls Street, approximately 2.2 miles south of the project site. The station houses one engine company, one truck company, and a Fire Hose Tender,[37] and is staffed by nine personnel per shift.
- Fire Station No. 25, at 3305 Third Street at Cargo Way, approximately 1 mile south of the project site. The station houses one engine company (designated as a BLS engine company),[38] a Multi-Casualty Unit,[39] and a Mini Pumper,[40] and is staffed by four personnel per shift, all of whom are EMT qualified.
- Fire Station No. 42, at 2430 San Bruno Avenue at Silver Avenue, approximately 2.5 miles south of the project site. The station houses one engine company and an Attack Hose Tender[41] and is staffed by four personnel per shift.

Fire Station Nos. 4 and 25 overlap with Fire Station No. 37's primary response area, and fire-fighting resources from these fire stations would be available upon request.

The following fire stations, located within 2 miles of the project site, would also provide fire-fighting resources upon request:

- Fire Station No. 7 (Battalion 6), at 2300 Folsom Street at 19th Street. The station houses one engine company (designated as an ALS engine company), one truck company, a heavy rescue squad unit, and a light rescue unit with a trailer. Its staff include personnel who are qualified as either EMTs or paramedics.
- Fire Station No. 8 (Battalion 3), at 36 Bluxome Street (between Fourth and Fifth streets). The station houses one engine company (designated as an ALS engine company) and one truck company. Its staff includes a Battalion Chief, two officers, and seven firefighters, all of whom are qualified as EMTs or paramedics.

[37] The Hose Tender provides an above-ground portable water supply system. This system can be strategically placed to provide adequate flow and pressure for firefighting when other sources of water supply fail or are not available.
[38] In January 2016 this engine will be designated as an ALS engine.
[39] The Multi-Casualty Unit was purchased with Homeland Security funds and is considered a regional response vehicle. The unit has the capability to manage up to 150 patients.
[40] Mini Pumpers respond to grass/brush fires. It is a Type 4 Engine with pump and roll capacity.
[41] The Attack Hose Tender provides a platform for transporting foam concentrate and related equipment for use as a suppression agent. It also provides an above-ground master stream appliance.

- Fire Station No. 29 (Battalion 2), at 299 Vermont Street. The station houses one engine company (designated as an ALS engine company). Its staff includes one officer and three firefighters, all of whom are qualified as EMTs or paramedics.

Between September 2014 and September 2015, Fire Station No. 37 responded to 1,091 Code 2 and 3 calls (189 and 902, respectively), which is an average of about three responses per day.[42] Fire Station No. 4 responded to 1,401 Code 2 and 3 calls (608 and 793, respectively), and Fire Station No. 25 responded to 3,897 Code 2 and 3 calls (1,500 and 2,397, respectively) during the same period.[43] Travel times between the project site and Fire Station Nos. 25 and 37 are under 3 minutes and 4 minutes, respectively, with travel assumed to take place along Wisconsin and 20th streets during weekday PM peak hour, travelling at posted speed limits, and obeying all traffic controls, which would be a conservative time estimate since emergency vehicles are able to travel without the same restrictions as an ordinary vehicle. For Fire Station No. 37, the average response time for Code 3 calls is 3 minutes and 54 seconds, which meets the City's target response goal for first on the scene.[44] For Fire Station Nos. 4 and 25, the average response times for Code 3 calls are 4 minutes and 16 seconds, and 3 minutes and 54 seconds, respectively.[45] Both fire stations meet the City's target response goal.

Water Supply for Fire Suppression

Citywide

Water for fire suppression in San Francisco is provided mainly from the potable water supply used for domestic and industrial water needs and managed by the San Francisco Public Utilities Commission (SFPUC).[46] The SFPUC provides fresh water for the SFFD's system of low-pressure hydrants as well as the high-elevation storage reservoir and tanks that feed the Auxiliary Water Supply System (AWSS). The AWSS, also known as the San Francisco Fire Department High Pressure System, is a gravity-fed system of water mains and 1,889 high-pressure fire hydrants that was built in 1913 solely for the purpose of firefighting.[47] The AWSS consists of a 135-mile pipeline network, a high-elevation storage reservoir with two large-capacity tanks, two pumping stations, fireboats, underground water storage tanks (cisterns), and San Francisco Bay water intakes (suction connections). The AWSS is divided into three zones to control water flow

[42] E-mail communication with Rhab Boughn, Public Records Officer, SFFD, December 23, 2015.
[43] E-mail communication with Rhab Boughn, Public Records Officer, SFFD, December 23, 2015.
[44] E-mail communication with Rhab Boughn, Public Records Officer, SFFD, December 23, 2015.
[45] E-mail communication with Rhab Boughn, Public Records Officer, SFFD, December 23, 2015.
[46] City and County of San Francisco Fire Department, Water Supply Systems. Available online at http://sf-fire.org/water-supply-systems. Accessed September 14, 2015.
[47] In the event the gravitational fresh water supply should fail, two pumping stations, located on the Bay Shore can, at a moment's notice, begin pumping salt water into the AWSS. There are five manifolds along the Bay to allow the SFFD fireboats to augment the system with bay water.

in the event of major damage to the SFPUC's distribution system. The AWSS incorporates the use of gate valves, which are placed at frequent intervals throughout the zones, so that a damaged section of the pipeline may be isolated and shut off separately, leaving the remainder of the AWSS operational during emergency. In the event of major damage to the SFPUC's distribution system and to the AWSS, the SFFD also has access to a system of underground cisterns with a total storage capacity of approximately 11 million gallons of water. This system consists of 172 cisterns strategically located throughout the City. However, SFFD cisterns have no connection to either the SFPUC water distribution network or the AWSS.[48] In addition to SFFD cisterns, practically all private and public water storage is available to the SFFD for emergency use. The SFPUC is responsible for the City's water supply and for the storage and distribution of water within the City. The SFFD is responsible for the location of all SFFD hydrants, as well as their maintenance and development; however, since May 2010, the SFPUC has been responsible for the service, maintenance, and improvement of the AWSS.[49]

Project Site

The AWSS does not extend into the project site; however, an existing AWSS water line extends along Third Street, west of the project site. There are also existing fire hydrants on the 28-Acre Site near Buildings 11 and 21. The SFFD fire boats, the *Phoenix* and the *Guardian*, can make connections directly into the AWSS via five special manifolds installed along the San Francisco Bay shoreline to serve as a back-up to the City's landside saltwater pumping stations. The nearest SFFD fire boat manifolds to the project site are at Islais Creek/Third Street to the south (approximately 1,000 feet south of the project site) and at Pier 22½ to the north.

PUBLIC SCHOOLS

The Environmental Setting and Impacts sections for the public schools discussion do not include information or analysis regarding private schools.

The San Francisco Unified School District (SFUSD) provides primary and secondary public education in San Francisco. The SFUSD manages 15 early education schools, 72 elementary schools (K-5), 12 middle schools (grades 6-8), 15 high schools (grades 9-12), 4 County and Court schools,[50] 13 charter schools, and 3 continuation/alternatively-configured schools with a total

[48] The cisterns are regularly inspected by the SFFD and are kept full by the SFPUC.
[49] In May 2010, the City and County of San Francisco Board of Supervisors and the Mayor approved the transfer of costs of operating, maintaining and improving the AWSS from the SFFD to the SFPUC.
[50] The County and Court school system educates children in the juvenile justice system.

enrollment of more than 53,000 students.[51] According to the 2013 American Community Survey, there are approximately 86,437 school-aged children in San Francisco.[52] In 2013, approximately 29.7 percent of students attended private school, 63.7 percent attended public school, and 6.6 percent of school-aged children are not enrolled in school.[53] Over the past five years, public elementary school student enrollment in the SFUSD has increased from approximately 21,663 to 23,047, while middle school and high school enrollment has decreased. Overall public school student enrollment between the 2009-2010 and 2014-2015 academic years has increased slightly from 55,240 to approximately 56,544.[54] The SFUSD projects its overall enrollment will increase slightly through 2016, with the largest increases projected for the elementary and middle school level and a slight increase projected for the high school level.[55]

As the SFUSD is not currently experiencing high growth rates, facilities throughout the City and County are generally underutilized. The SFUSD maintains a property and building portfolio that has a student capacity for over 90,000 students. As such, the SFUSD currently has more classrooms district-wide than it needs, resulting in a surplus of property.[56,57] The SFUSD has responded to this trend by closing and merging certain schools, and is not planning to construct new schools near the project site.

Students are assigned to elementary schools through a choice process designed to provide equitable access to the range of opportunities in the schools. Students are placed in the schools that correspond to their highest ranked request as long as there are openings. If there are more

[51] San Francisco Unified School District (SFUSD), SFUSD's 2013-15 Strategic Plan. Available online at http://www.sfusd.edu/en/assets/sfusd-staff/about-SFUSD/files/SFUSD%20Strategic%20Plan.pdf. Accessed September 14, 2015.

[52] U.S. Census Bureau, 2009-2013 5-Year American Community Survey, San Francisco County, California, Children Characteristics. Available at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF. Accessed September 14, 2015.

[53] U.S. Census Bureau, 2009-2013 5-Year American Community Survey, San Francisco County, California, Children Characteristics. Available online at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF. Accessed September 17, 2015.

[54] SFUSD, Research Planning and Accountability Data Center, School List and Summary – Student Enrollment. Available online at http://web.sfusd.edu/Services/research_public/rpa_student_enrollment/SFUSD%20School%20Site%20List%20and%20Summary-%20Student%20Enrollment%20[Most%20Current].pdf. Accessed September 14, 2015.

[55] SFUSD, *SFUSD Recommended Budget for Fiscal Year 2015 – 2016*, p. 22, June 23, 2015. Available online at http://www.sfusd.edu/en/assets/sfusd-staff/about-SFUSD/files/budget/Budget%20Book%20Master%20Vol%20I.pdf. Accessed December 1, 2015.

[56] SFUSD, SF Address & School Locator, December 2015. Available online at http://enrollinschool.org/lookup/. Accessed on December 2, 2015.

[57] SFUSD, *Capital Plan FY 2010-2019*, pp. 24-25, September 2009. Available online at http://www.sfusd.edu/en/assets/sfusd-staff/about-SFUSD/files/capital-plan-final-2010-2019.pdf. Accessed September 16, 2015.

requests for a school than openings, the student placement process uses a series of preferences, known as tie-breakers, to assign students to one of their requested schools.[58]

The elementary school nearest the project site is Daniel Webster Elementary School at 465 Missouri Street, located approximately 0.5 mile west of the project site.[59] For the 2015-2016 academic year, this school had a total K-5 enrollment of 275 students.[60] According to the current SFUSD enrollment and matriculation process, students who attend this elementary school would subsequently attend James Lick Middle School at 1220 Noe Street, approximately 2.5 miles west of the project site.[61] This school has an enrollment of 601 students.[62] After middle school, students would apply to any high school in the City. The public high school nearest the project site is the International Studies Academy at 655 De Haro Street, approximately 0.7 mile west of the project site. The International Studies Academy has an enrollment of 128 students.[63]

LIBRARIES

The San Francisco Public Library operates the Main Library at Civic Center, 100 Larkin Street, and 28 neighborhood branches throughout San Francisco. The libraries provide reading rooms, book lending, information services, access to technology, and library-sponsored public programs. The public libraries within 2 miles of the project site are the Potrero Branch at 1616 20th Street, approximately 0.5 mile northwest of the project site; the Mission Bay Branch at 960 Fourth Street, approximately 1 mile north of the project site; and the Bayview Branch at 5075 Third Street, approximately 1.6 miles south of the project site.

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[58] SFUSD, Enrollment Guide 2016-2017. Available online at http://www.sfusd.edu/en/assets/sfusd-staff/enroll/files/2016-17/2016-17_enrollment_guide_en.pdf. Accessed September 26, 2016.

[59] For elementary schools, a lottery that gives some weight to the attendance area in which the student resides is used to assign students. There is no requirement that the elementary attendance area school be chosen by parents, nor can placement at the elementary attendance area school be guaranteed. Beginning in 2017, 5th grade students will receive an automatic, initial assignment into their designated middle school feeder. They will also have an opportunity to apply for enrollment at other middle schools, but there will be a guaranteed assignment into the middle school based on where they attend elementary school. Available online at http://www.sfusd.edu/en/enroll-in-sfusd-schools/frequently-asked-questions.html. Accessed September 15, 2015.

[60] SFUSD, Research Planning and Accountability Data Center, School List and Summary – Student Enrollment. Available online at http://web.sfusd.edu/Services/research_public/rpa_student_enrollment/SFUSD%20School%20Site%20List%20and%20Summary-%20Student%20Enrollment%20[Most%20Current].pdf. Accessed December 1, 2015.

[61] SFUSD Address and School Locator. Available online at http://www.sfpublicschools.org/php/. Accessed September 14, 2015.

[62] SFUSD, Research Planning and Accountability Data Center, School List and Summary – Student Enrollment. Available online at http://web.sfusd.edu/Services/research_public/rpa_student_enrollment/SFUSD%20School%20Site%20List%20and%20Summary-%20Student%20Enrollment%20[Most%20Current].pdf. Accessed December 1, 2015.

[63] SFUSD, Research Planning and Accountability Data Center, School List and Summary – Student Enrollment. Available online at http://tinyurl.com/lekoo89. Accessed September 14, 2015.

All branch libraries offer books at adult, teen, and children reading levels. Basic collections consist of fiction, nonfiction, and reference books; magazines; newspapers; audio books; CDs; and DVDs. Most of the San Francisco Public Library's collection of electronic resources is accessible to library patrons at all branch locations and available 24 hours a day at the San Francisco Public Library website.

Specific materials that are not available at a San Francisco Public Library branch may be obtained through the library's request system, Link+, or through the Interlibrary Loan program. Link+ allows library patrons to borrow items from participating libraries throughout California. Items typically arrive within five days and may be returned to any branch.[64] Interlibrary Loan allows library patrons to borrow items from various libraries and institutions in North America that have agreed to loan items to one another. Program participants may include local universities such as the University of California Berkeley, San Francisco State University, or Stanford University.[65]

In 1994, San Francisco voters passed Proposition E, a Charter amendment that created the Library Preservation Fund, which provided library services and materials and aids in the operation of library facilities. Proposition E requires the City to maintain funding for the San Francisco Public Library at a level no lower than the amount it spent during the 1992–1993 fiscal year. Voters renewed the Library Preservation Fund in November 2007 (Proposition D).

Branch Library Improvement Program

The Branch Library Improvement Program (BLIP) resulted from a bond measure passed in November 2000 to provide $106 million in funding to upgrade San Francisco's branch library system, and Proposition D, which passed in November 2007, authorizing additional funding to improve the branches. These funds were used to establish the Mission Bay Branch, which opened in July 2006. The BLIP included the preparation of the Branch Facilities Plan, which was intended to guide and identify the particular needs and standards for the neighborhood branches of the San Francisco Public Library. Public libraries near the project site have all been either newly constructed or renovated and expanded within the last five years due to BLIP funding.

[64] San Francisco Public Library, Link+, November 2015. Available online at http://sfpl.org/index.php?pg=2000033101. Accessed November 18, 2015.

[65] San Francisco Public Library, Interlibrary Loan (ILL) Frequently Asked Questions, November 2015. Available online at http://sfpl.org/index.php?pg=2000032501. Accessed November 18, 2015.

REGULATORY FRAMEWORK

POLICE

State

There are no State regulations related to police activities that are applicable to the Proposed Project.

Local

San Francisco Police Code

The San Francisco Police Code contains regulations for various types of activities such as automobile use, permitting and licensing, use of ports, and disorderly conduct.

San Francisco General Plan

The Community Facilities Element of the *San Francisco General Plan* establishes objectives, policies, and criteria for meeting San Francisco's long-range police facility requirements, including distribution, location, design, and use of police facilities. The following objective and policies are relevant to the Proposed Project:

Objective 1: Distribute, locate, and design police facilities in a manner that will enhance the effective, efficient and responsive performance of police functions.

- Policy 1.1: Locate police functions that are best conducted on a centralized basis in a police headquarters building.
- Policy 1.2: Provide the number of district stations that balance service effectiveness with community desires for neighborhood police facilities.
- Policy 1.3: Enhance closer police/community interaction through the decentralization of police services that need not be centralized.

FIRE AND EMERGENCY MEDICAL SERVICES

State

California Fire Code

State fire regulations are set forth in Sections 13000 *et seq*. of the California Health and Safety Code, which include regulations concerning building standards (as also set forth in the California Building Code), fire protection and notification systems, fire protection devices (such as extinguishers and smoke alarms) and standards (such as those for high-rise buildings and child care facilities), and fire suppression training. California Fire Code Section 403.2 addresses public

safety for both indoor and outdoor gatherings, including emergency vehicle ingress and egress, fire protection, emergency medical services, public assembly areas and the directing of both attendees and vehicles (including vehicle parking), vendor and food concession distribution, and the need for the presence of law enforcement and fire and emergency medical services personnel at the event.

Local

San Francisco Fire Code

The San Francisco Fire Code incorporates by reference the 2013 California Fire Code (Title 24, California Code of Regulations, Part 9), with certain local amendments.[66] The San Francisco Fire Code was revised in 2013 to regulate and govern the safeguarding of life and property from fire and explosion hazards arising from the storage, handling, and use of hazardous substances, materials, and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises; to provide for the issuance of permits, inspections, and other SFFD services; and to assess and collect fees for those permits, inspections, and services.[67] San Francisco Fire Code Section 503 (Fire Apparatus Access Roads) and San Francisco Public Works' 2015 Subdivision Regulations (Order No. 183447) establish requirements for minimum street widths to facilitate emergency equipment access. San Francisco Fire Code Section 511 (Local Fire Safety Feature Requirements) requires that buildings with floors used for human occupancy located 75 feet above the lowest level of SFFD vehicle access (usually 75 feet above the street) have an air replenishment system so that firefighters can refill air bottles for their self-contained breathing apparatus. The system must be tested and maintained pursuant to the Fire Department Administration Bulletin 5.07.[68]

The SFFD reviews building plans to ensure that fire and life safety are provided and maintained in the buildings that fall under its jurisdiction. SFFD plan review applies to the following occupancy types:

- Assembly occupancies (including restaurants and other gathering places for 50 or more occupants);
- Educational occupancies (including commercial day care facilities);
- Hazardous occupancies (including repair garages, body shops, fuel storage, and emergency generator installation);

[66] City and County of San Francisco, *Ordinance 200-13* (File No. 130786, approved October 3, 2013, effective November 2, 2013, operative January 1, 2014).
[67] Ibid.
[68] All buildings that are covered by this section but are equipped with a fire service access elevator pursuant to California Building Code Section 3007 are not required to install an air replenishment system.

- Storage occupancies where potential exists for high-piled storage as defined in San Francisco Fire Code Section 112.2, Table 112 A;
- Institutional occupancies;
- High-rise buildings of all occupancies;
- Residential occupancies, such as hotels, motels, lodging houses, residential care facilities, apartment houses, small- and large-family day care homes, certified family-care homes, out-of-home placement facilities, halfway houses, and drug and/or alcohol rehabilitation facilities (R-1, R-2, R-2.1, R-3.1, and R-4 occupancies);
- Tents, awnings, or other fabric enclosures used in connection with any occupancy; and
- All fire alarm and fire suppression systems.

In coordination with the Department of Building Inspection, the SFFD conducts plan checks to ensure that all structures, occupancies, and systems listed above are designed in accordance with the San Francisco Building Code.

San Francisco General Plan

The Community Facilities Element of the *San Francisco General Plan* establishes objectives, policies, and criteria for meeting San Francisco's long-range fire and emergency medical facility requirements, including distribution, location, design, and use of facilities. The following objective is relevant to the Proposed Project:

> Objective 5: Development of a system of firehouses which will meet the operating requirements of the Fire Department in providing fire protection services and which will be in harmony with related public service facilities and with all other features and facilities of land development and transportation provided for other sections of the General Plan.

SCHOOLS

State

Senate Bill 50 and Proposition 1A

The major source of school funding for construction and modernization was the State School Construction Program until the passage of the Leroy F. Greene School Facilities Act, or Senate Bill 50 (Chapter 407, Statutes of 1998), and Proposition 1A, both of which passed on November 3, 1998. Senate Bill 50 (SB 50) and Proposition 1A provided a comprehensive school facilities financing and reform program, which authorized a $9.2 billion school facilities bond issue. The provisions of SB 50 prohibit local agencies from denying land use approvals on the basis that school facilities are inadequate, and establish a school facility fee cap for legislative actions (e.g., general plan amendments, specific plan adoption, zoning plan amendments). According to Government Code Section 65996, the development fees authorized by SB 50 are

deemed to be full and complete school facilities mitigation. The legislation also recognized the need for the fee to be adjusted periodically to keep pace with inflation. Local jurisdictions are further precluded from imposing school-enrollment-related mitigation beyond the development impact fees. These provisions are in effect and would remain in place as long as subsequent State bonds are approved and available. As a result of this legislation, school districts would continue to levy a school fee under existing statutes (California Government Code Sections 65995, 65995.5, and 65995.7).

Local

San Francisco General Plan

The Community Facilities Element of the *San Francisco General Plan* establishes objectives, policies, and criteria for meeting San Francisco's long-range educational facility requirements, including distribution, location, design, and use of facilities. The following objective and policy are relevant to the Proposed Project:

Objective 8: Assure that public school facilities are distributed and located in a manner that will enhance their efficient and effective use.

Policy 8.1: Provide public school facilities for education in accordance with the need for such facilities as defined by the Unified School District and Community College District. Locate such facilities according to the Public School Facilities Plan and, wherever possible, make available for community use.

School Development Impact Fee

The SFUSD began collecting State-authorized school impact fees in 1987. These fees are collected to mitigate impacts associated with enrollment growth (e.g., enrollment growth from new residential development). The SFUSD collects fees for all construction and building permits issued within the City. Developer fee revenues are used, in conjunction with other SFUSD funds, to support efforts to complete capital improvement projects. Development impact fees are collected when building permits are issued and are based on the type of land use and its size, rather than the anticipated number of new students that may be generated.[69] The current fees applicable to the Proposed Project are $3.36 per square foot of space for residential development, $0.54 per square foot of covered and enclosed space for commercial/industrial development applicable to the Office land use category, $0.425 per square feet of space for commercial/industrial development applicable to the Industrial/Warehousing/Manufacturing land use

[69] SFUSD, Developer Impact Fee Annual and Five Year Reports for the Fiscal Year Ending June 30, 2015, December 8, 2015, p. 2. Available online at http://www.sfusd.edu/assets/sfusd-staff/_site-wide/files/SFUSD_AnnualFiveYearReports_FY1415.pdf. Accessed May 20, 2016.

category, and $0.346 per square foot of covered and enclosed space for commercial/industrial development applicable to the Retail and Services land use category.[70]

LIBRARIES

San Francisco General Plan

The Community Facilities Element of the *San Francisco General Plan* establishes objectives, policies, and criteria for meeting San Francisco's long-range facility requirements, including the distribution, location, design, and use of library facilities. The following objective is relevant to the Proposed Project:

> Objective 6: Development of a public library system in San Francisco which will make adequate and efficient library service freely available to everyone within the City, and which will be in harmony with related public service facilities and with all other features and facilities of land development and transportation provided for in other sections of the *General Plan*.

San Francisco Public Library Strategic Plan (2003–2006)

The *San Francisco Public Library Strategic Plan* (*Strategic Plan*) was adopted in 2003 and is the library's guiding policy and planning document. The *Strategic Plan* does not set a standard for library service, but provides every library with a unifying organizational vision and system-wide goals. These goals are broad and flexible so that services can be tailored to the unique needs of each neighborhood.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The threshold for determining the significance of impacts in this analysis is consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following threshold was used to determine whether implementing the Proposed Project would result in a significant impact to public services. Implementation of the Proposed Project would have a significant effect on public services if the Proposed Project would:

> L.1 Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any

[70] San Francisco Planning Department, San Francisco Citywide Development Impact Fee Register, December 1, 2015. Available online at http://default.sfplanning.org/administration/Master_Impact_Fee_Schedule_2016_DBI_Register-040416.pdf. Accessed March 20, 2016.

public services such as fire and emergency medical protection, police protection, schools, libraries, or other services.

APPROACH TO ANALYSIS

The impact analysis considers the increase in demand for public services that would occur under the Proposed Project, and whether or not significant adverse physical impacts would result with the increase in demand. The Proposed Project could have a significant impact on public services if (1) it would require the construction of new or physically altered governmental facilities in order to maintain acceptable levels of public services, and (2) the construction or alteration of such facilities would result in one or more substantial adverse impacts on the environment.

Those features of the Pier 70 Mixed-Use District Project that could affect public services within the project site would be different under the Maximum Residential Scenario and the Maximum Commercial Scenario. Since each scenario would result in different estimated population and employment numbers, each scenario is analyzed separately in the "Impact Evaluation" discussion, below.

PROJECT FEATURES

The Proposed Project entails the development of the 28-Acre Site and the Illinois Parcels at Pier 70. The Proposed Project would include residential, commercial-office, and retail/arts/light-industrial (RALI) uses. Under the provisions of the proposed Special Use District (SUD), the Proposed Project would provide a flexible land use program, under which certain parcels could be developed for primarily commercial-office or residential uses. The two scenarios, the Maximum Residential Scenario and the Maximum Commercial Scenario, would have different effects on the increase in demand for public services. The Maximum Residential Scenario would have 3,025 residential units, 1,102,250 gross square feet (gsf) of commercial use, and 479,980 gsf of RALI use (269,495 gsf of retail, 67,375 gsf of restaurant, and 143,110 gsf of art/light-industrial). The Maximum Commercial Scenario would result in 1,645 residential units, 2,262,350 gsf of commercial use, and 486,950 gsf of RALI use (275,075 gsf of retail use, 68,765 gsf of restaurant use, and 143,110 gsf of art/light-industrial). As shown in Table 4.L.1: Population and Employment Estimates for the Maximum Residential Scenario and the Maximum Commercial Scenario, the Proposed Project would introduce approximately 3,735 (under the Maximum Commercial Scenario) to 6,868 (under the Maximum Residential Scenario) residents to the project site, depending on which scenario is constructed. The proposed new residential uses would displace a portion of the existing on-site employment, but overall employment at the project site would increase. Under the Proposed Project, between approximately 5,599 (under the Maximum Residential Scenario) to 9,768 (under the Maximum Commercial Scenario) on-site employees would be introduced to the project site (see Table 4.L.1). Since the Maximum

Residential Scenario would generate an average daily population of approximately 12,465 persons on the project site (6,868 residents and 5,599 employees), it would have the greater potential impact on public services.

Table 4.L.1: Population and Employment Estimates for the Maximum Residential Scenario and Maximum Commercial Scenario

	Maximum Residential Scenario	Maximum Commercial Scenario
Population of 28-Acre Site[1]	4,881	2,497
Population of Illinois Parcels	1,987	1,238
Total	**6,868 residents**	**3,735 residents**
Employment at 28-Acre Site[2]	5,443	8,754
Employment at Illinois Parcels	156	1,014
Total	**5,599 employees**	**9,768 employees**

Notes:

[1] ABAG Projections 2013 estimates 2.27 persons per household in San Francisco for 2015.

[2] Employment numbers for residential, open space, and parking uses were determined utilizing the factors in Table III.C-7 from the City of San Francisco, Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, p. III.C-12, November 2009.

IMPACT EVALUATION

Police

Impact PS-1: The Proposed Project would not result in the need for new or physically altered facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police protection. *(Less than Significant)*

Maximum Residential Scenario

Impacts on police protection services are considered significant if an increase in population would result in an increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. The Proposed Project would be constructed in a fully developed area of San Francisco. However, the project site is underutilized and implementation of the Proposed Project would introduce new uses (e.g., residential, commercial-office, RALI, and open space) and increase the density of development at the project site.

The existing population of the Bayview Police District is approximately 80,000.[71] The Maximum Residential Scenario would add up to 6,868 residents to the project site (4,881 residents on the 28-Acre Site and 1,987 residents on the Illinois Parcels), which would increase the number of people residing in the Bayview Police District by about 8.6 percent.[72] Furthermore, the number of employees at the project site would increase by approximately 5,599 under the Maximum Residential Scenario (5,443 employees on the 28-Acre Site and 156 employees on the Illinois Parcels). The addition of residents and employees at the project site would incrementally increase demand for police protection services. Assuming 6,868 new residents at the project site and the Bayview Police District's average reported crime rate of about 55.39 crimes per 1,000 residents per year,[73] the Maximum Residential Scenario could add about 381 additional calls for assistance per year. This represents an 8.3 percent increase in calls per year.

The *District Station Boundary Analysis Report* includes housing and population projections for each respective police district. This report indicates that there would be 15,206 new residential units added to the Bayview Police District as part of its projected district growth; however, the housing projections do not include the proposed new residential units associated with the Proposed Project.[74] Boundary line changes proposed in the *District Station Boundary Analysis Report* would reduce the Bayview Police District's service area, allowing it to absorb future population and employment growth within the district. Therefore, although the 3,025 new residential units proposed under the Maximum Residential Scenario were not accounted for in the *District Station Boundary Analysis Report's* calculations, no new facilities or physical alterations to the Bayview Police District's existing facilities would be expected to be needed to meet the increased demand generated by the Proposed Project.[75]

The increased demand generated by the Maximum Residential Scenario would require one patrol unit, which typically consist of up to five officers on staggered shifts.[76] The Port of San Francisco would continue to contract with the SFPD for two additional officers to provide police services to the project site. The *Pier 70 Waterfront Site and Illinois Street Parcel Development*

[71] SFPD, San Francisco Police Department 2014 Annual Report. Available online at https://www.dropbox.com/s/mpfjb7eoy54vsrb/2014%20Annual%20Report.pdf?dl=0. Accessed May 25, 2016.

[72] 6,868 [approximate Maximum Commercial Scenario population] / 80,000 [existing Bayview Police District population] = 8.6 percent increase.

[73] SFPD, CompStat, December 2013. Available online at http://www.sf-police.org/Modules/ShowDocument.aspx?documentid=27342. Accessed September 22, 2015.

[74] City and County of San Francisco – Controller's Office, *District Station Boundaries Analysis*, March 3, 2015, p. 65. Available online at http://sfcontroller.org/Modules/ShowDocument.aspx?documentid=6273. Accessed September 14, 2015.

[75] E-mail communication with Sarah Dennis-Phillips, Office of Economic & Workforce Development, December 1, 2015.

[76] City and County of San Francisco, *Pier 70 Waterfront Site and Illinois Street Parcel Development Projects Findings of Fiscal Responsibility and Feasibility*, May 21, 2013, pp. 28-29.

Projects Findings of Fiscal Responsibility and Feasibility, prepared for the Proposed Project, further indicated that, depending on the demand for additional supervisorial and other specialized law enforcement services in addition to patrol, and the number and type of service calls generated from the project site, the number of required sworn officers could be greater. Nevertheless, the provision of additional police services, including those requiring additional patrol vehicles, would not require the need for new or physically altered facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police protection.[77] Police staffing increases are expected to occur over the next several years to meet the City Charter mandate for the number of sworn police officers.[78] The increases in staff across the SFPD would further alleviate any demand for additional staff as a result of the Proposed Project.

In conclusion, the Maximum Residential Scenario would result in an increase in the average daily population (approximately 6,868 residents and 5,599 employees) at the project site and would cause an incremental increase in demand for police services. Additional police officers would be needed as a result. However, the increase in demand would not require the construction of a new facility, or the expansion of existing facilities to maintain acceptable service ratios, response times, or other performance objectives.[79] Therefore, impacts to police services under the Maximum Residential Scenario would be less than significant, and no mitigation measures are necessary.

Maximum Commercial Scenario

As shown in Table 4.L.1, the Maximum Commercial Scenario would add up to 3,735 residents to the project site (2,497 on the 28-Acre Site and 1,238 on the Illinois Parcels), which would increase the number of people residing in the Bayview Police District by about 4.7 percent.[80] Furthermore, the number of employees at the project site would increase by approximately 9,768 (8,754 on the 28-Acre Site and 1,014 on the Illinois Parcels). The addition of residents and employees at the project site would incrementally increase demand for police protection services in the Bayview Police District, which has an average reported crime rate of about 55.39 crimes per 1,000 residents per year.[81] Assuming 3,735 new residents at the project site and the same

[77] E-mail communication with Sarah Dennis-Phillips, Office of Economic & Workforce Development, December 1, 2015.
[78] SFPD, Annual Report 2013, pp. 56-57. Available online at https://dl.dropboxusercontent.com/u/76892345/Annual%20Reports/2013%20Annual%20Report.pdf. Accessed September 14, 2015.
[79] E-mail communication with Sarah Dennis-Phillips, Office of Economic & Workforce Development, December 1, 2015.
[80] 3,735 [approximate Maximum Commercial Scenario population] / 80,000 [existing Bayview Police District population] = 4.7 percent increase.
[81] SFPD, CompStat, December 2013. Available online at http://www.sf-police.org/Modules/ShowDocument.aspx?documentid=27342. Accessed September 22, 2015.

crime rate, the Maximum Commercial Scenario could add about 207 additional calls for assistance per year. This represents a 4.8 percent increase in calls per year.

The *District Station Boundary Analysis Report* includes housing and population projections for each respective police district. This report indicates that there would be 15,206 new residential units added to the Bayview Police District as part of its projected district growth; however, the housing projections do not include the proposed new residential units associated with the Proposed Project.[82] Boundary line changes proposed in the *District Station Boundary Analysis Report* would reduce the Bayview Police District's service area, allowing it to absorb future population and employment growth within the district. Therefore, although the 1,645 new residential units proposed under the Maximum Commercial Scenario were not accounted for in the *District Station Boundary Analysis Report's* calculations, no new facilities or physical alterations to the Bayview Police District's existing facilities would be expected to be needed to meet the increased demand generated by the Proposed Project.[83]

This increase in the number of calls for service is less than the increase assumed with implementation of the Maximum Residential Scenario. Similar to the discussion above for the Maximum Residential Scenario, the increase in residents and on-site employment under the Maximum Commercial Scenario may result in the need for additional officers (up to one patrol unit) in the Bayview Police District, but it would not necessitate the need for the construction of a new facility, or the expansion of existing facilities, to maintain acceptable service ratios, response times, or other performance objectives.[84] Therefore, impacts to police services under the Maximum Commercial Scenario would be less than significant, and no mitigation measures are necessary.

Fire and Emergency Medical Services

Impact PS-2: The Proposed Project would not result in the need for new or physically altered facilities in order to maintain acceptable response times for fire protection and emergency medical services. *(Less than Significant)*

Maximum Residential Scenario

The Proposed Project would include the construction and rehabilitation of residential, commercial, and RALI buildings that would be subject to current State and local regulations governing fire and life safety in new construction and building rehabilitation. The SFFD, Port,

[82] City and County of San Francisco – Controller's Office, *District Station Boundaries Analysis*, March 3, 2015, p. 65. Available online at http://sfcontroller.org/Modules/ShowDocument.aspx?documentid=6273. Accessed September 14, 2015.
[83] E-mail communication with Sergeant Maria Ciriaco, Legal Division, SFPD, November 4, 2015.
[84] E-mail communication with Sarah Dennis-Phillips, Office of Economic & Workforce Development, December 1, 2015.

and Department of Building Inspection would review building plans to ensure that buildings comply with fire and life safety measures specified in the San Francisco Fire Code, including measures relating to emergency access and egress; sprinkler systems; fire-rated design, construction, and materials; restrictions on occupant loads; emergency lighting; smoke alarms; and mechanical smoke control and emergency notification systems. Adherence to San Francisco Fire Code requirements would minimize demand for future fire protection services. The buildings located on Parcels A, B, C1, C2, D, E1, F, G, H1, and H2 that would have a final finished floor elevation located 75 feet above street level would have an air replenishment system so that firefighters can refill air bottles for their self-contained breathing apparatus, in accordance with Section 511 of the San Francisco Fire Code. Conversely, the design of the proposed buildings could include a fire access elevator to comply with San Francisco Fire Code Section 511.

To meet firefighting water requirements, the Proposed Project may be required to include two sources of water delivery (connections to two separate water mains), additional AWSS high-pressure distribution piping, an AWSS cistern, and/or potable water supply system equipment. The AWSS components would be in addition to the existing potable water fire hydrants located near Buildings 11 and 21. (Refer to "High-Pressure Auxiliary Water Supply System" in Section 4.K, Utilities and Service Systems, pp. 4.K.9-4.K.10, for more information regarding the AWSS system.) Additionally, the SFFD fire boats could provide a supplemental source of emergency water, because the Third Street/Islais Creek AWSS fire boat manifold is located approximately 1,000 feet south of the project site.

Fire Station No. 37, which would be the first responder to the project site, is relatively underutilized (three to four responses per day) and could accommodate the incremental increase in fire and medical emergency incidents that would be attributable to the increase in the residential and employment population at the project site. However, the introduction of 6,868 residents and 5,599 employees to the project site under the Maximum Residential Scenario would require additional fire protection personnel and medical emergency responders. Specifically, one additional ambulance would be staged at Fire Station Nos. 37, 4, 7, or 9 to help the SFFD maintain adequate response times. The increase in fire protection and emergency medical personnel, including those required for the additional ambulance, would not require the construction of a new facility or the expansion of an existing facility.[85] The Maximum Residential Scenario is not anticipated to substantially alter demand for services such that it would degrade service levels below adopted performance objectives, nor would it require new

[85] E-mail communication with Jessica Kennedy, Senior Analyst/Support Services, SFFD, November 13, 2015.

fire protection service facilities or emergency medical response services beyond those now provided and planned for the area.[86]

Currently, Code 3 emergency response times at the project site are less than 4 minutes, well within the State objective of 5 minutes and the City standard of 4 minutes and 30 seconds. Code 3 response times are anticipated to remain within the State objective, as the new street network would be designed in accordance with the San Francisco Fire Code and San Francisco Public Works regulations related to emergency access. Emergency vehicles would continue to access the project site from Third, Illinois, 20th, and 22nd streets. Additionally, the Proposed Project includes a new connection to the site from Illinois Street at 21st Street. Aside from the general increase in vehicle traffic that would result from the additional activity at the project site, the Proposed Project would not inhibit emergency access to the project site.[87] Standards for emergency access and circulation have been included in the *Pier 70 SUD Design for Development*, and the Pier 70 Transportation and Master Utilities Plans. Standards in the *Pier 70 SUD Design for Development* include emergency vehicle rights-of-way, fire access amenities, and road weight capacities. Furthermore, the internal circulation plan would be approved by the Planning Department and SFFD to ensure sufficient maneuverability within the project site.

For the reasons stated above, the Maximum Residential Scenario's impacts on fire protection and emergency medical services would be less than significant, and no mitigation measures are necessary.

Maximum Commercial Scenario

Under the Maximum Commercial Scenario, the introduction of 3,734 new residents and 9,768 net new workers to the project site, and the construction of residential and commercial buildings on the project site would increase the demand for fire and emergency medical services, similar to the Maximum Residential Scenario. Because the increase in call volumes, and thus the demand for services, is anticipated to be similar under both scenarios, the impact on fire and emergency medical services identified above for the Maximum Residential Scenario would also apply to the Maximum Commercial Scenario. Like the Maximum Residential Scenario, the Maximum Commercial Scenario would require additional fire and emergency medical personnel. To accommodate the increased demand, one additional ambulance would be staged at Fire Station Nos. 37, 4, 7, or 9 to help the SFFD maintain adequate response times. The increase in fire protection and emergency medical personnel, including those required for the additional ambulance, would not require the construction of a new facility or the expansion of an existing

[86] E-mail communication with Jessica Kennedy, Senior Analyst/Support Services, SFFD, November 13, 2015.
[87] Fehr & Peers, *Transportation Impact Study - Pier 70 Mixed-Use District Project*, December 2016, p. 67.

facility.[88] Therefore, impacts under the Maximum Commercial Scenario would be less than significant, and no mitigation measures are necessary.

Schools

Impact PS-3: The increase in students associated with implementation of the Proposed Project would not require new or expanded school facilities, the construction of which could result in substantial adverse impacts. (*Less than Significant*)

Maximum Residential Scenario

The Maximum Residential Scenario would increase the project site population by 6,868 residents, of which a portion would be school-aged children who would attend public elementary, middle, and high school facilities in San Francisco, and would add a total of 3,025 residential units to the project site (2,150 residential units on the 28-Acre Site and 875 residential units on the Illinois Parcels). Based on SFUSD's student generation rate of 0.16 student per residential unit,[89] the Maximum Residential Scenario would increase the demand for schools by about 484 students.

As discussed above under Environmental Setting, elementary school enrollment has increased over the last five years, and SFUSD projections indicate that elementary school enrollment will continue to grow. The SFUSD maintains a property and building portfolio that has a student capacity for over 90,000 students. Current student enrollment is considerably less than 90,000, resulting in substantial amounts of surplus property.[90] Thus, even with increasing enrollment, SFUSD facilities throughout the City are underutilized. The increase of 484 students associated with the Proposed Project would not substantially change the demand for schools, nor would it result in the need for new facilities.

The Leroy F. Greene School Facilities Act of 1998, or SB 50, restricts the ability of local agencies to deny land use approvals on the basis that public school facilities are inadequate. SB 50, however, permits the levying of developer fees to address local school facility needs resulting from new development. Local jurisdictions are precluded under State law from imposing school-enrollment-related mitigation beyond the school development fees. The SFUSD collects these fees for all construction and building permits issued within the City and County of San Francisco. Developer fee revenues are used, in conjunction with other SFUSD funds, to support efforts to complete capital improvement projects. The School Impact Fees to be collected

[88] E-mail communication with Jessica Kennedy, Senior Analyst/Support Services, SFFD, November 13, 2015.
[89] Lapkoff & Gobalet Demographic Research, Inc., *Demographic Analyses and Enrollment Forecasts for the San Francisco Unified School District*, p. 1-6, March 18, 2010.
[90] SFUSD, Capital Plan 2010-2019, pp. 24-25. Available online at http://www.sfusd.edu/en/assets/sfusd-staff/about-SFUSD/files/capital-plan-final-2010-2019.pdf. Accessed September 15, 2015.

for residential, commercial, and retail developments are set at $3.36 per square foot for new residential construction, $0.346 per square foot for retail space, $0.54 per square foot for office space, and $0.425 per square foot for commercial/industrial development.[91]

The estimated increase of 484 students under the Maximum Residential Scenario would not result in the need for new facilities because of the existing available capacity within the SFUSD system. Furthermore, the Proposed Project would pay school impact fees. Therefore, project-related impacts on SFUSD facilities and services that would result from the implementation of the Maximum Residential Scenario would be less than significant, and no mitigation measures are necessary.

Maximum Commercial Scenario

The Maximum Commercial Scenario would increase the project site population by 3,735 residents, of which a portion would be school-aged children who would attend public elementary, middle, and high school facilities in San Francisco, and would provide a total of 1,645 residential units on the project site (1,100 residential units on the 28-Acre Site and 545 residential units on the Illinois Parcels). Based on SFUSD's student generation rates of 0.16 student per residential unit, the Maximum Commercial Scenario would increase the demand for schools by about 264 students; however, as described above for the Maximum Residential Scenario, existing school facilities have the capacity to meet increases in demand. The estimated increase of 264 students under the Maximum Commercial Scenario would not result in the need for new facilities because of the available capacity within the SFUSD system. In addition, the project sponsors would be required to pay school impact fees. Thus, implementation of the Maximum Commercial Scenario would not substantially change the demand for schools, nor would it result in the need for new facilities. Therefore, project-related impacts on SFUSD facilities and services that would result from the implementation of the Maximum Commercial Scenario would be less than significant and no mitigation is required.

[91] San Francisco Planning Department, San Francisco Citywide Development Impact Fee Register, Updated December 1, 2015, Effective January 1, 2016. Available online at http://default.sfplanning.org/administration/Master_Impact_Fee_Schedule_2016_DBI_Register-040416.pdf. Accessed on May 26, 2016.

Libraries

Impact PS-4: The Proposed Project would not result in an increase in demand for library services that could not be met by existing library facilities. *(Less than Significant*)

Maximum Residential Scenario

The number of new residents at the project site under the Maximum Residential Scenario would represent an approximately 448 percent increase in the total number of residents located in Census Tract 226, the census tract in which the project site is located. Although this increase would be large for the project area, it would be not be substantial for the City as a whole, because it would represent 2.4 percent of the total Citywide population growth from 2010 to 2040. Residential and nonresidential development associated with the Proposed Project would increase demand for local library services. However, the existing library branches near the project site have been either recently renovated or constructed in accordance with the Branch Facilities Plan (the Mission Bay Branch was constructed in July 2006, the Potrero Branch was renovated in 2010, and the Bayview Branch was constructed in 2013), and they would therefore be able to meet the demand for library services generated by the 6,868 residents and 5,599 employees at the project site under the Maximum Residential Scenario. The Proposed Project would not require construction of new or expanded library facilities beyond those already proposed or under construction under the BLIP.

Thus, the new, existing, and rebuilt San Francisco Public Library branches could accommodate increased demand from the Proposed Project, and no additional library facilities would be required. Impacts on library services would be less than significant, and no mitigation measures are necessary.

Maximum Commercial Scenario

The number of new residents at the project site under the Maximum Commercial Scenario would represent an approximately 243 percent increase in the total number of residents located in Census Tract 226, the census tract in which the project site is located. Although this increase would be large for the project area, it would be not be substantial for the City as a whole, because it would represent 1.3 of the total Citywide population growth from 2010 to 2040. As discussed above, the surrounding branch libraries have been either recently renovated or constructed under the BLIP. The existing library branches near the project site would be able to meet the demand for library services generated by the up to 3,735 residents and 9,768 employees at the project site under the Maximum Commercial Scenario. Impacts on library services would therefore be less than significant.

Cumulative Impacts

Impact C-PS-1: The Proposed Project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable contribution to significant adverse cumulative impacts that would result in a need for construction of new or physically altered facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services, including police protection, fire protection and emergency services, schools, and libraries. (*Less than Significant*)

Build-out of the Proposed Project, in conjunction with reasonably foreseeable projects, would increase overall demand for police protection, fire protection and emergency response, schools, and library services provided by the SFPD, SFFD, SFUSD, and San Francisco Public Library, respectively. This analysis of the contribution of the Proposed Project to cumulative public service impacts is based on consideration of the reasonably foreseeable future projects identified in Section 4.A, Introduction to Chapter 4, pp. 4.A.12-4.A.18, along with development anticipated as part of the *Central SoMa Plan*, formerly known as the *Central Corridor Plan*. The *Central SoMa Plan* is a draft plan that may allow for a large amount of development activity along a planned rail corridor in the vicinity of the project site. If approved, it would increase the number of housing units within the Central SoMa Plan Area by up to 7,500 new units and would create up to 45,000 new jobs, requiring the provision of additional public services.[92]

Police Services

The Proposed Project would add to the demand for police services in the Bayview Police District, but the cumulative contribution of the Proposed Project's impact with the reasonably foreseeable development projects would not be considerable. The SFPD has not identified a Citywide service gap and has undergone redistricting options in order to ensure that all areas of the City are adequately served by police service facilities. Recent redistricting efforts in June 2015 anticipated and planned for population growth of 15,205 households, or an increase of 26.5 percent, in the Bayview Police District. Although the Proposed Project was not considered in the *District Station Boundary Analysis*, other reasonably foreseeable projects used in the cumulative analysis of this Environmental Impact Report were within the scope of analysis. As the redistricting would reduce the Bayview Police District's service area, it would be able to absorb future population and employment growth within the district, including the demand generated by the Proposed Project.[93] Therefore, the estimated increase in residents as a result of the Proposed Project (Maximum Residential Scenario and Maximum Commercial Scenario) and

[92] San Francisco Planning Department, *Central SoMa Plan & Implementation Strategy*, Draft for Public Review, August 2016.
[93] E-mail communication with Sergeant Maria Ciriaco, Legal Division, SFPD, November 4, 2015.

reasonably foreseeable projects would not be beyond levels anticipated and planned for by the SFPD. Based on Board of Supervisors legislation, the police district boundaries would be reanalyzed every 10 years with consideration to workload, district boundary considerations, response times, and facilities. For these reasons, the Proposed Project's contribution to cumulative demand on police services Citywide would not be cumulatively considerable. The Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would have a less-than-significant cumulative impact on police services.

Fire Protection and Emergency Services

The Proposed Project would add to the demand for fire response and emergency medical services within Battalion 10, but the cumulative contribution of the Proposed Project's impact combined with the reasonably foreseeable development projects would not be considerable. The SFFD has not identified a Citywide service gap, and the incremental increase in the demand for fire and emergency medical services as a result of the Proposed Project and reasonably foreseeable projects would not be beyond levels anticipated and planned for by the SFFD. If necessary, Fire Station Nos. 4, 7, and 9, along with other nearby stations, could respond to calls in the event Fire Station No. 37 staff and equipment are unavailable or require additional support. For these reasons, the Proposed Project's contribution to cumulative demand on fire and emergency medical services Citywide would not be cumulatively considerable. The Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would have a less-than-significant cumulative impact on fire and emergency services.

Schools

Development of cumulative projects within the City would result in increased population and employment-generating uses, which would result in an associated increase in the number of students to be served by the SFUSD. Although San Francisco elementary student populations have increased over recent years, middle and high school enrollment continues to decline; thus, SFUSD facilities remain well below their capacity of 90,000 students. The SFUSD began collecting State-authorized school impact fees in 1987, which are collected to address impacts associated with enrollment growth. The SFUSD collects these fees for most construction and building permits issued within the City. Developer fee revenues are used, in conjunction with other SFUSD funds, to support efforts to complete capital improvement projects. According to Government Code Section 65996, the development fees authorized by SB 50 are deemed to be full and complete school facilities mitigation. Therefore, the Proposed Project's contribution to cumulative demand on public schools would not be cumulatively considerable. The Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would have a less-than-significant cumulative impact on school services.

Libraries

The BLIP, launched as a result of a 2000 bond measure, included plans for construction of eight new library branches. Most branch libraries in the City have already been constructed or renovated, or are planned for future construction or renovation under the BLIP (including the newly constructed Bayview Branch and renovated and expanded Potrero Branch).

As stated in the *San Francisco Public Library Strategic Plan,* there is no national standard for library service, and each library must evaluate how it may best meet the needs of the community. To this end, the *Strategic Plan* provides every library facility and program with a unifying organizational vision and system-wide goals. Development of reasonably foreseeable future projects within the City, in conjunction with past and present development, would increase resident population as well as generate new employment, which could increase demand on public library resources. The *Strategic Plan* is based, in part, on population projections for build-out of the *General Plan*, which includes the development anticipated at the project site. All cumulative projects (past, present, and reasonably foreseeable) that are within the identified population projections are understood to have been considered during development of the *Strategic Plan*. Therefore, it is not anticipated that cumulative development would result in a significant cumulative impact on library services. There is no significant cumulative impact with respect to library resources, and the Proposed Project's contribution to cumulative demand would be less than significant.

In conclusion, the Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would result in less-than-significant cumulative impacts on public services.

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M. BIOLOGICAL RESOURCES

Section 4.M, Biological Resources, begins with a description of the existing conditions for terrestrial and marine biological resources that occur or have the potential to occur on the project site or in the immediate vicinity. Regulations and guidelines relevant to biological resources are discussed next, followed by an impacts analysis that evaluates the potential effects on biological resources that would result from implementation of the Proposed Project. Mitigation measures that would avoid or reduce impacts to less-than-significant levels are identified. Cumulative effects of the Proposed Project in combination with past, present, and reasonably foreseeable future projects are discussed.

This section identifies project study areas for both terrestrial and marine biological resources, and assesses the potential impacts on these resources that would result from construction and operation of the Proposed Project. Aside from database searches, a fixed buffer area is not defined for the study areas; however, the Proposed Project's potential area of influence relevant to each biological resource was considered. Information on natural communities, plant and animal species, and sensitive biological resources was obtained from regional databases, plans, and reports relevant to the Proposed Project, including the California Natural Diversity Database (CNDDB),[1] the California Native Plant Society (CNPS) Electronic Inventory,[2] California Department of Fish and Wildlife (CDFW),[3,4] the U.S. Fish and Wildlife Service (USFWS),[5] the National Oceanic and Administration (NOAA) Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay,[6] long-term regional studies such as the Regional Monitoring Program for Water Quality in San Francisco Bay,[7] the Interagency Ecological

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1 California Natural Diversity Database (CNDDB), Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version, 2015. Accessed August 21, 2015.

2 California Native Plant Society (CNPS), Inventory of Rare and Endangered Plants for San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, 2015. Available online at http://www.rareplants.cnps.org/. Accessed August 21, 2015.

3 California Department of Fish and Wildlife (CDFW), 2015, Natural Diversity Database. October 2015. Special Animals List. Periodic publication.

4 CDFW, 2015, Natural Diversity Database. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication, October 2015.

5 U.S. Fish and Wildlife Service (USFWS), My Project, IPaC Trust Resource Report of Federally Endangered and Threatened Species in the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, August 20, 2015.

6 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay (hereinafter referred to as Report on the Subtidal Habitats). June 2007.

7 San Francisco Estuary Institute and the Aquatic Science Center, 2015, Clean Water Program. Available online at http://www.sfei.org/programs/cleanwater. Accessed August 17, 2015.

Program (IEP) for San Francisco Bay,[8] standard biological literature, eBird.org,[9] biological reports and studies from other waterfront locations in the project vicinity,[10,11,12,13] and focused and reconnaissance-level surveys of the project site. A reconnaissance-level botanical and terrestrial wildlife survey of the project site was conducted on August 20, 2015, to characterize existing conditions, assess habitat quality, and assess the potential presence of special-status species and sensitive natural communities. Rare plant surveys of the Irish Hill portion of the project site were conducted on March 30 and May 3, 2016.[14] A survey of marine habitat and wildlife was performed by an independent consultant on April 20, 2015.[15]

ENVIRONMENTAL SETTING

For the purposes of this California Environmental Quality Act (CEQA) assessment, the project study area for terrestrial biological resources includes the project site and landside areas adjacent to it with similar habitat composition that includes developed or paved areas with long-standing industrial uses from Mission Creek to the north, Islais Creek to the south, and the I-280 Freeway corridor to the west. The baseline development projects listed in Section 4.A, Introduction to Chapter 4, pp. 4.A.5-4.A.12, are considered the baseline conditions for this analysis. The marine/aquatic biological resources study area includes San Francisco Bay shoreline along the project site and San Francisco Bay Central Bay basin waters immediately adjacent to the project site, though marine resources documented in all waters of the Central Bay basin from the north side of Treasure Island to the San Bruno Shoals, which demark the southern border of Central San Francisco Bay, were considered in this analysis. The shoreline and adjacent San Francisco

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8 Interagency Ecological Program, Cooperative Ecological Investigations in the San Francisco Estuary since 1970. Available online at http://www.water.ca.gov/iep/. Accessed August 18, 2015.

9 eBird, An online database of bird distribution and abundance [web application]. Agua Vista Park Hotspot. eBird, Ithica, New York. Available online at http://www.ebird.org. Accessed September 28, 2015.

10 Weeden, N., and M. Lynes, Summary Report of Avian Surveys Conducted in 2008 at Dilapidated Piers and Other Structures along the Port of San Francisco's Southern Waterfront Properties, 2009 (hereinafter referred to as Summary Report of Avian Surveys Conducted in 2008). Unpublished report (GGA-2009-01). Golden Gate Audubon Society, Berkeley, California.

11 The Port of San Francisco, *Pier 94 Wetland Enhancement Monitoring Report*. San Francisco, California. June 1, 2010.

12 Bartley, E., N. Weeden, A. Opkins, M. Ziatunich, and M. Chambers, *A Field Guide to 100 Birds of Heron's Head, Islais Creek to Candlestick Point*, 2010. San Francisco, California.

13 Coastal Conservancy, *Clapper Rail Surveys for the San Francisco Estuary Invasive Spartina Project*, 2013. Prepared by Jen McBroom, Olofson Environmental, Inc., November 2013.

14 Environmental Science Associates (ESA), Pier 70 Mixed-Use Development Project: Results of the March 30, 2016 and May 3, 2016, Irish Hill rare plant surveys, May 25, 2016.

15 Applied Marine Sciences, Inc. (AMS), Intertidal Habitat and Biological Community Survey Along the Pier 70 Redevelopment Site (hereinafter referred to as Intertidal Habitat and Biological Community Survey). Report prepared for Turnstone Consulting / SWCA, San Francisco, California, April 20, 2015.

Bay waters comprising the marine resources study area have been extensively modified from their prior natural condition; however, they remain ecologically productive habitats. Figure 4.M.1: Terrestrial Biological Resources Study Area, and Figure 4.M.2: Marine Biological Resources Study Area, p. 4.M.4 and p. 4.M.5, depict, respectively, the generalized study areas for the terrestrial and marine biological resources considered in this analysis.

REGIONAL SETTING

The project site is located in the San Francisco Bay Area-Delta region, which hosts a diverse variety of natural communities ranging from the open waters of San Francisco Bay and the Delta to salt and brackish marshes to chaparral and oak woodlands. The climate is Mediterranean in nature, with relatively mild, wet winters and warm, dry summers. The high diversity of vegetation and wildlife found in the region is a result of soils, topography, and microclimate diversity that promotes relatively high levels of endemism.[16]

San Francisco Bay is the second largest estuary in the United States and supports numerous marine habitats and biological communities. It encompasses 479 square miles, including shallow mudflats. San Francisco Bay is divided into four main basins: San Pablo or North Bay, Suisun Bay, Central Bay, and South Bay.[17] This assessment focuses on the southernmost portion of the Central Bay basin. Depending on the use, the Central Bay basin of San Francisco Bay has different geographic boundaries. For the purposes of this CEQA analysis, the geographic boundaries for the Central Bay basin are between the Richmond-San Rafael Bridge and the San Bruno Shoal, located 11.5 miles south of the San Francisco-Oakland Bay Bridge, and connect to the Pacific Ocean through the Golden Gate. The regional setting for purposes of evaluating marine biological resources includes both the shoreline intertidal habitats and the shallow water habitats – the "baylands"[18] and the deeper waters of San Francisco Bay itself that are located in the southernmost area of the Central Bay basin. The marine biological biota found in the Central Bay basin includes invertebrate infauna[19] and mobile epifauna[20] that inhabit San Francisco Bay sediments; sessile[21] and encrusting invertebrates and marine vegetation on natural and human-

[16] Endemism refers to the degree to which organisms or taxa are restricted to a geographical region or locality and are thus individually characterized as endemic to that area.
[17] NOAA, Report on the Subtidal Habitats.
[18] Goals Project, 1999, *Baylands Ecosystem Habitat Goals.* A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, California.
[19] Organisms living in the sediments of the San Francisco Bay floor.
[20] Organisms living on the surface of the San Francisco Bay floor, or attached to submerged objects or aquatic animals or plants.
[21] Permanently attached or established; not free to move about.



PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.M.1: TERRESTRIAL BIOLOGICAL RESOURCES STUDY AREA



PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.M.2: MARINE BIOLOGICAL RESOURCES STUDY AREA

made hard substrates; and planktonic organisms, fish, marine mammals, and marine birds that inhabit or use the open waters of San Francisco Bay. These habitats and their associated biological communities are described below in more detail.

PROJECT SITE SETTING

Terrestrial Vegetation Communities and Wildlife Habitats

Natural communities are assemblages of plant and wildlife species that occur together in the same area, which are defined by species composition and relative abundance. The terrestrial biological resources study area contains developed/landscaped/ruderal (weedy) and eucalyptus grove plant communities, which were identified during the terrestrial resources reconnaissance survey on August 20, 2015.

Developed/Landscaped/Ruderal

The majority of the project site (i.e., most areas within the 28-Acre Site and the Illinois Parcels) is paved and currently developed with buildings, mainly warehouses, associated with the previous use of the site. The terrestrial resources study area surrounding and including the project site is also mostly developed, in keeping with the conditions and previous uses of the project site.

Some long-abandoned landscaping occurs among the existing buildings and parking lots. This includes various yucca (*Yucca* spp.) plants, garden geranium (*Pelargonium* spp.), and a few common fig (*Ficus carica*), loquat (*Eriobotrya japonica*), and conifer trees. Areas dominated by often temporary assemblages of opportunistic non-native plants that thrive in disturbed areas were characterized as ruderal habitat. Within the project site, this vegetation type occurs in pavement cracks, along edges of buildings or parking lots, and in the few undeveloped portions of the site such as the radio tower location on the northeast portion of the site and on the northern and eastern slopes of the remnant of Irish Hill. Non-native plant species typical of ruderal vegetation in the terrestrial study area or observed during the reconnaissance survey of the project site include ripgut brome (*Bromus diandrus*), slender wild oat (*Avena barbata*), soft chess (*Bromus hordeaceus*), Italian ryegrass (*Festuca perennis*), English plantain (*Plantago lanceolata*), sheep sorrel (*Rumex acetosella*), cheeseweed mallow (*Malva parviflora*), stinkwort (*Dittrichia graveolens*), prickly sow thistle (*Sonchus asper* ssp. *asper*), sweet clover (*Melilotus* spp.), alfalfa (*Medicago sativa*), red valerian (*Centranthus ruber*), pampas grass (*Cortaderia selloana*), and sweet fennel (*Foeniculum vulgare*), which is the dominant species on site. Native herb associates include telegraph weed (*Heterotheca grandiflora*) and Canadian horseweed (*Erigeron canadensis*).

Landscaped and ruderal areas can provide cover, foraging, and nesting habitat for a variety of bird species as well as reptiles and small mammals, especially those that are tolerant of

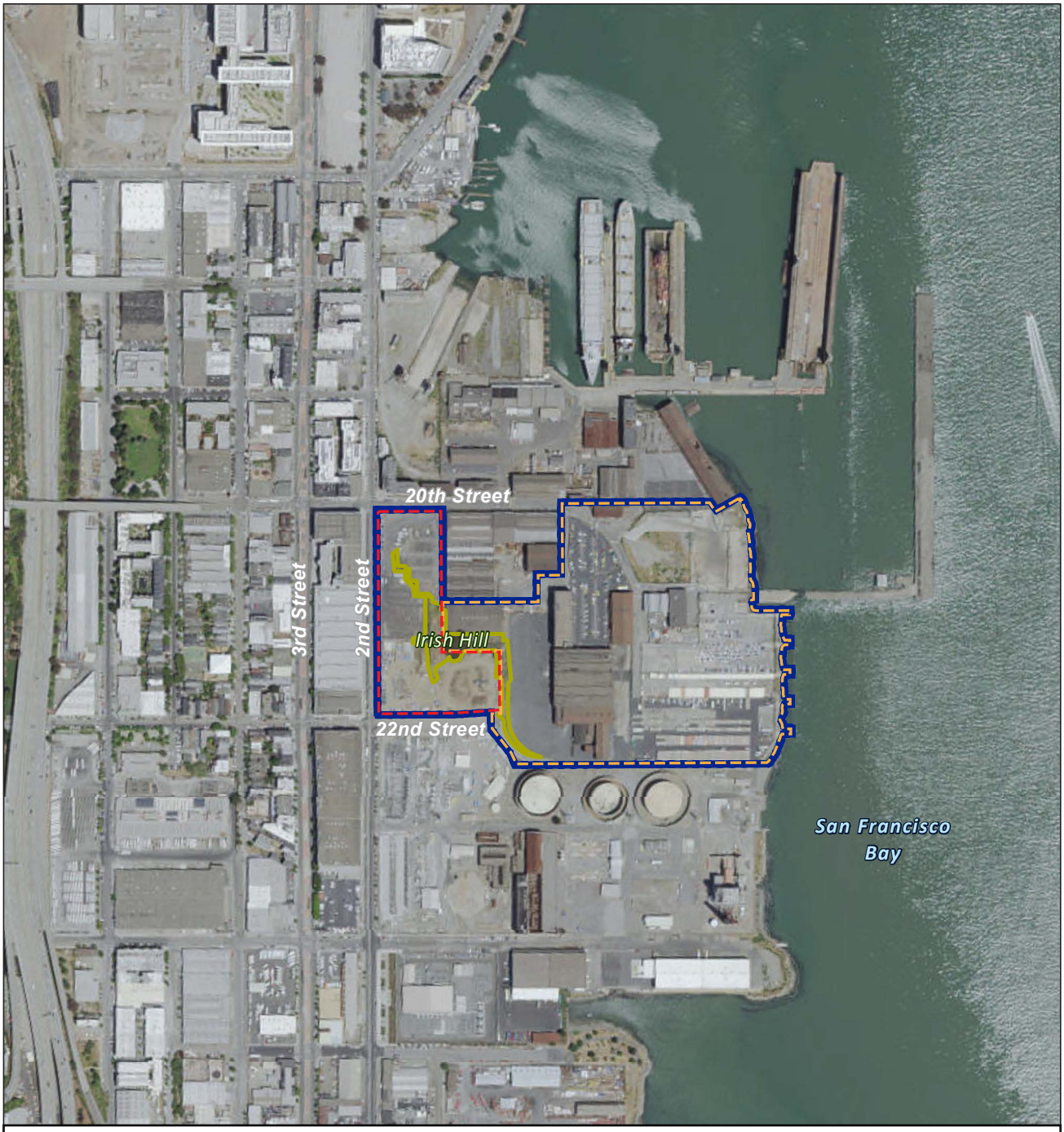
disturbance and human presence. Birds commonly found in such areas are typically seed-eating or accustomed to scavenging human litter. In the terrestrial study area these include non-native species, such as house sparrow (observed feeding on poison hemlock [*Conium maculatum*] seeds during the reconnaissance survey), rock pigeon, and European starling (*Sturnus vulgaris*). Native bird species found in such an environment include house finch (*Haemorhous mexicanus*), American goldfinch (*Spinus tristis*), lesser goldfinch (*Spinus psaltria*), Brewer's blackbird (*Euphagus cyanocephalus*), and mourning dove (*Zenaida macroura*). These species are common to highly developed urbanized areas. Other wildlife common to such an urban area includes striped skunk (*Mephitis mephitis*) and raccoon (*Procyon lotor*), and non-natives such as Virginia opossum (*Didelphis virginiana*), Norway rat (*Rattus norvegicus*), black rat (*Rattus rattus*), and feral cat. Vacant buildings can serve as roosting sites for local bats or as nesting sites for common urbanized birds such as barn owl (*Tyto alba*), cliff swallow (*Petrochelidon pyrrhonota*), rock pigeon, and house sparrow. Common bats, such as Mexican free-tailed bat (*Tadarida brasiliensis*), can also adapt to living in urban areas near water and roost in structures that provide adequate thermal regulation.

IRISH HILL SERPENTINE ROCK AND SOILS

The 1.4-acre remnant of Irish Hill located in the eastern portion of the project site is a serpentine rock outcrop with loose soil and ruderal vegetation covering its northern and eastern sides. Irish Hill is largely located on the Hoedown Yard portion of the Illinois Parcels and partially on the 20th/Illinois Parcel and the 28-Acre Site. The northern spur of Irish Hill snakes, from north to south, through paved portions of the 20th/Illinois Parcel built up to the remaining bluff adjacent to the 28-Acre Site. Figure 4.M.3: Serpentine Rock and Soils on the Project Site, depicts the extent of serpentine rock and soils associated with Irish Hill.

Although serpentine soils of the San Francisco peninsula have been documented to host a specialized group of rare and sensitive plants, historical disturbance of Irish Hill due to its location within the former industrial area has resulted in a dominance of non-native and invasive vegetative cover consistent with other ruderal vegetation of the project site, described above. Invasive sweet fennel thrives in disturbed areas and covers a majority of Irish Hill, and persistent human presence was evident. Trails or paths have been created up the hill slope, and discarded trash was visible. Special-status plants with an affinity for serpentine soils may have once occupied Irish Hill; however, rare plant surveys of this feature conducted in 2016 were negative and no special-status plant populations occur within the project site.[22]

[22] ESA, Pier 70 Mixed-Use Development Project: Results of the March 30, 2016 and May 3, 2016, Irish Hill Rare Plant Surveys, May 25, 2016.



PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.M.3: SERPENTINE ROCK AND SOILS ON PROJECT SITE

Eucalyptus Grove

The grove of trees within the terrestrial resources study area primarily consists of a small stand of non-native blue gum eucalyptus (*Eucalyptus globulus*) located at the east-facing slope of Irish Hill. Trees in this stand occur in both the Hoedown Yard portion of the Illinois Parcels and the 28-Acre Site. Ground cover within this stand is exclusively leaf litter with no understory plant species. Given that the trees inhabit only 0.2 acre and are exposed on a hill, they do not provide habitat functions that are normally found in forest ecosystems that support a diverse array of native species. Native species such as red-tailed and red-shouldered hawks (*Buteo jamaicensis; B. lineatus*), American robin (*Turdus migratorius*), chestnut-backed chickadee (*Poecile rufescens*), pygmy nuthatch (*Sitta pygmaea*), Anna's hummingbird (*Calypte anna*), California towhee (*Melozone crissalis*), western grey squirrel (*Sciurus griseus*), and the non-native eastern fox squirrel (*Sciurus niger*) may occur in non-native forest communities; however, common terrestrial mammals discussed above in "Developed/Landscaped/Ruderal," pp. 4.M.6-4.M.7, would be more common to such an isolated site.

Marine Communities

Intertidal habitat, subtidal habitat, and open water habitat comprise the marine communities within the marine study area identified during the marine resources reconnaissance survey on April 20, 2015.

Intertidal Habitat

San Francisco Bay waterfront areas of the project site can be divided into three distinctly different segments. The first area coincides with Reaches I and II[23] (see Figure 2.25: Shoreline Improvements Map, in Chapter 2, Project Description, pp. 2.72) and has a gentle slope transiting from a short bluff at the edge of a concrete slab down to the water's edge with distinct low, middle, and high intertidal zones containing natural (quarry rock) and artificial (concrete-riprap, debris, and abandoned creosote wharf pilings) materials. Reach II is a concrete breakwall that is perpendicular to the edge of the water. The second area coincides with Reach III and consists of a short section in each of the four former slipways and the concrete sides of the slipways. This area contains natural and artificial riprap (quarry rock, concrete, and brick debris) similar to Reach I in the high and middle intertidal zones. Exposed concrete slab floor and bulkheads (sides of the former slipways) characterize the habitat in the lower intertidal zone. The third area coincides with Reach IV and is very similar to the first area (Reach I) in that it contains natural

[23] Moffatt & Nichol, Pier 70 Development Preliminary Shoreline Improvements Report, San Francisco, CA (hereinafter referred to as Preliminary Shoreline Improvements Report). Prepared for Forest City. August 2015. 107 pp.

and artificial riprap with a gentle slope to the edge of the water. It differs from Reach I, however, in that it curves inland to match up with the adjacent property, covers a shorter span from high to low intertidal zones, contains no creosote wharf pilings, and, because of its natural slope, has a distinct upper intertidal zone but a mixed or combined middle and lower intertidal zone.[24]

The invertebrate and algae species observed inhabiting the three intertidal zones (low, middle, and high) are typical for the Central Bay basin. The dominant algae species include sea lettuce (*Ulva* spp.), rockweed (*Fucus gardeneri*), the red algae species (*Polyneura Latisima*) and *Gigartina* spp.), and the non-native brown algae species (*Sargossum muticum*). Sea lettuce dominated the high intertidal zone; sea lettuce, rockweed, and red algae dominated the middle intertidal zone; and brown algae dominated the low intertidal zone.[25]

Invertebrate taxa inhabiting the Proposed Project shoreline include balanoid barnacles (Balanidae) in the high and middle intertidal zones; limpets, both species of *Mytilus* mussels, and shore crabs in the middle and low intertidal zones; and the native oyster (*Ostrea luidia*) in the lower middle and low intertidal zones. Both live and long-dead oysters (bottom shell present) were observed, with only a few live oysters observed compared to the number of dead oysters, suggesting high predation. Although there was minimal evidence of high siltation at the site, the invertebrate community observed was relatively limited compared to intertidal communities observed at Treasure and Yerba Buena islands, 3.3 miles north of Pier 70.[26] Additionally, no evidence of other invasive algae species was observed, such as sushi kelp (*Undaria pinnatifida*), which has taken a foothold at South Beach marina, adjacent to AT&T Park and just north and east of the marine study area.

Western sandpiper (*Calidris mauri*), least sandpiper (*C. minutilla*), sanderling (*C. alba*), and spotted sandpiper (*Actitis macularius*) may forage among the riprap and few sandy areas exposed during low tide within the intertidal zone of the marine study area.

Subtidal Habitat

The near-shore subtidal area immediately adjacent to the project site can be characterized as a predominantly soft substrate habitat comprised of soft mud (silt and clay) and sand with occasional quarry rock, concrete, and brick debris that has become dislodged from the armored

[24] AMS, Intertidal Habitat and Biological Community Survey.
[25] AMS, Intertidal Habitat and Biological Community Survey.
[26] AMS, Survey of Intertidal Habitat and Marine Biota at Treasure Island and Along the Western Shoreline of Yerba Buena Island (hereinafter referred to as Survey of Treasure Island Intertidal Habitats). Report prepared for the Treasure Island Redevelopment Project, San Francisco, California, April 2009.

shoreline or historically dumped when the facility was an active shipyard.[27] Additionally, the area contains numerous artificial hard substrates in the form of the aforementioned quarry rock, concrete, and brick debris as well as abandoned and decaying creosote wood pilings from former docks and wharfs.[28] Water depths range from shallow subtidal areas (less than 3.3 feet in depth) to maintained navigation channels (around 39 feet in depth).

The waters of San Francisco Bay adjacent to the project site are part of the Central Bay basin, which is typically characterized as either a polyhaline[29] or euhaline[30] salinity environment. The marine infaunal community (organisms that live within or near the surface of seafloor sediments) consists of amphipod and decapod crustaceans, bivalves, polychaete and oligochaete worms, bryozoans, gastropod snails, ascidians, octocorals, phoronids, tanaids, and cumaceans. NOAA identified 45 taxa inhabiting shallow subtidal, slough channel, and main channel polyhaline habitats and 57 taxa inhabiting three similar euhaline seafloor habitats within San Francisco Bay.[31]

The most common large mobile invertebrate organisms in the Central Bay basin include blackspotted shrimp (*Crangon nigromaculata*), California bay shrimp (*C. franciscorum*), Dungeness crab (*Cancer Magister*), and the slender rock crab (*C. gracilis*). Although other species of shrimp are present (*C. nigricauda, C. munitella, Palaemon macrodactylus, and Exopalaemon carinicauda),* their overall presence in the Central Bay basin is significantly reduced when compared to the number of blackspotted and California bayshrimps present.[32] All of these mobile invertebrates are present throughout the Central Bay basin and provide an important food source for carnivorous fishes, marine mammals, and birds in San Francisco's food web. Dungeness crabs use most of San Francisco Bay as an area for juvenile growth and development prior to returning to the ocean as sexually mature adults.[33]

The Central Bay basin has the largest accumulation of hard substrate in San Francisco Bay. The hard substrate benthos in San Francisco Bay consists of both natural and artificial surfaces. Natural substrates include boulders, rock face outcrops, and low-relief rock. Artificial hard substrate includes submerged concrete breakwalls, bulkheads, vessel structures, pilings, riprap,

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27 NOAA, Report on the Subtidal Habitats.
28 AMS, Intertidal Habitat and Biological Community Survey.
29 Polyhaline refers to a body of water with salinity concentrations ranging between 18.0 and 30.0 parts per thousand (ppt).
30 Euhaline refers to a body of water with salinity concentrations ranging between 30.0 and 35.0 ppt.
31 NOAA, Report on the Subtidal Habitats.
32 NOAA, Report on the Subtidal Habitats.
33 Tasto, R.N., "San Francisco Bay: Critical to the Dungeness Crab?" *In:* T.J. Conomos, editor, *San Francisco Bay: The Urbanized Estuary*, 1979. Pacific Division of the American Association for the Advancement of Science, San Francisco, California: 479–490.

and pipelines. Pilings, riprap, and pipelines can be found in every San Francisco Bay region and are a dominant feature along the Port's waterfront, including the project site.

Subtidal hard substrate areas provide habitat for an assemblage of marine algae, invertebrates, and fishes, similar to the hard substrate in the intertidal zone of the Central Bay basin. Submerged hard bottom substrate is typically covered with a mixture of turf organisms that is dominated by hydroids, bryozoans, tunicates, encrusting sponges, encrusting diatoms, and anemones. Pacific rock crab (*Cancer antennarius*) and the red rock crab (*C. productus*) inhabit rocky, intertidal, and subtidal areas in the Pacific Ocean, and likely use San Francisco Bay as an extension of their coastal habitats.[34] The Pacific and red rock crabs are frequent targets of sport anglers from piers and jetties.

Subtidal plants and submerged aquatic vegetation occur throughout the Central Bay basin on both soft and hard substrate. On the shallow unconsolidated subtidal habitat within the Central Bay basin, such as the intertidal mudflats in Richardson Bay, the green algae—*Ulva/Enteromorpha*, *Gracillaria verrucosa* (formerly *pacifica*), *Ruppia maritime*, *Potamogeton pectinatus*, and eelgrass (*Zostera marina*)—frequently occur.[35] Eelgrass is a shallow subtidal as well as intertidal flowering plant found inhabiting bays, estuaries, and the leeside of islands. There are no known submerged aquatic vegetation beds in San Francisco Bay waters adjacent to or near the project site.

The bottom, or demersal, fish community reported to inhabit the area surrounding Pier 70 is composed of 49 species, dominated by speckled sanddab (*Citharichthys stigmaeus*), comprising 31.3 percent of the total fish abundance, and the Bay goby (*Lepidogobius lepidus*), accounting for 27.7 percent, based on fish census data collected between 2009 and 2013.[36] Eight additional species of fish have been commonly observed in association with the seafloor or inhabit the waters immediately above the seafloor in and around the project area: plainfin midshipmen (*Porichthys notatus*), English sole (*Parophrys vetulus)*, brown rockfish (*Sebastes auriculatus*), shiner perch (*Cymatogaster aggregata*), white croaker (*Genyonemus lineatus*), Pacific staghorn sculpin (*Leptocottus armatus*), longfin smelt (*Spirinchus thaleichthys*), and California tonguefish

[34] Hieb, K., *Cancer* Crabs. In: James J. Orsi, *Report on the 1980-1995 Fish, Shrimp, and Crab Sampling in the San Francisco Estuary, California*, 1999. Available online at http://www.estuaryarchive.org/archive/orsi_1999, 1999.

[35] NOAA, Report on the Subtidal Habitats.

[36] AMS, Fish Species Inhabiting the Central San Francisco Bay Region Near the Port of San Francisco (hereinafter referred to as Fish Species Inhabiting the Central San Francisco Bay Region). Report prepared for Turnstone Consulting-SCWA, San Francisco, California, August 2015.

(*Symphurus atricaudus*).[37] These eight taxa accounted for an additional 35.8 percent of the community during the period from 2009 to 2013.

Non-Native Marine Species

One of the greatest threats to San Francisco Bay marine subtidal and intertidal habitats is from the introduction of non-native species. The introduction of non-native species into the San Francisco Bay ecosystems can result in large-scale changes to the marine communities. It is estimated that a new species is introduced into San Francisco Bay every 14 weeks based on the number of known introduced species into San Francisco Bay since tracking began in 1960.[38] Most fail to survive their introduction into San Francisco Bay waters, but some that have survived have produced major ecological changes in resident biological communities. This has been the case with the introduction of the Asian clams (*Potamocorbula amurensis* and (*Corbicula fluminea*), which resulted in significant changes in native benthic infaunal communities in the western Delta and Sacramento and San Joaquin rivers. Historically, the principal mechanism of introduction into San Francisco Bay has been fouling, boring, and release of ballast-dwelling organisms. Introduced species include snails, shrimp, plankton, crabs, and algae.

Introduced species now dominate all benthic communities within San Francisco Bay and make up more than 95 percent of the biomass and total abundance of organisms.[39] Estuaries and sheltered coastal areas appear to be among the most invaded habitats as a result of being naturally disturbed, low-diversity systems with historic centers of anthropogenic (human-made or -caused) disturbance from shipping, industrial development, and urbanization.[40] Another concern regarding invasive marine organisms is their potential to spread throughout San Francisco Bay waters once they are introduced to the region or the acceleration of their spreading throughout San Francisco Bay, as has occurred with the algae *Undaria*, for example.

Open Water Habitat

Because of its close proximity to the Pacific Ocean through the Golden Gate, the open water environment of the Central Bay basin in and around the project site is most like and strongly influenced by the open water coastal environment. Because of its lack of significant freshwater inflow, the phytoplankton and zooplankton communities are almost entirely marine in composition and seasonality. The copepods (*Acartia clausi*, *A. californiensis*, and *Oithona*

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[37] AMS, Fish Species Inhabiting the Central San Francisco Bay Region.

[38] Roman, J., Aquatic Invasive Species, 2010 (hereinafter referred to as Aquatic Invasive Species). Available online through the Encyclopedia of Earth, http://www.eoearth.org/view/article/51cbecf37896bb431f68eaf4/. Accessed August 28, 2015.

[39] Roman, J., Aquatic Invasive Species.

[40] Ray, G., Invasive Marine and Estuarine Animals of California, ERDC/TC ANSRP-05-2, August 2005.

davisae), harpacticoid copepods, tintinnids, and the larvae of gastropods, bivalves, barnacles, and polychaetes dominate the community structure.[41] Mean zooplankton biomass, or the total number of zooplanktonic organisms occurring in the water column, has ranged from 10 to 50 milligrams per cubic centimeter for San Francisco Bay with the Central Bay basin averaging approximately 30 milligrams per cubic meter.[42] Unlike the North and South Bay basins, the Central Bay basin is the least affected by introduced exotic species.[43]

Central Bay basin meroplankton, including macrozooplankton and micronekton, is dominated by the ctenophore (*Pleruobranchia bachei*), the isopod (*Syndotea laticauda*), the shrimps (*Palaemon macrodactylus*, *Crangon franciscorum*, and *C. Nigricauda*), the mysid (*Neomysis kadiakensis*), and the medusa (*Polyorchis* spp.).[44] Those meroplankton taxa that are found year-round throughout the Central Bay basin include two of the shrimp species (*Crangon fransicorum and C. nigricauda*) and northern anchovy (*Engraulis mordax*).[45]

Thirty-five species of pelagic[46] fish (living in open water) have been documented inhabiting the deep and shallow water areas of Central Bay basin near Pier 70 between 2009 and 2013. Three of these species account for over 98.0 percent of the total abundance of fish present, with the dominant species, northern anchovy, comprising 88.3 percent of the fish inhabiting the pelagic community. Pacific herring (*Clupea pallasii*), the second most common fish species, accounted for 8.3 percent of the total abundance, and jacksmelt (*Atherinopsis californiensis*) accounted for 2.2 percent of the total abundance inhabiting the water column.[47]

Marine Birds

Typical marine birds regularly inhabiting or using the open waters of the study area include double-crested and Brandt's cormorants (*Phalacrocorax auritus* and *P. penicillatus*), pigeon guillemot (*Cepphus columba*), herring gull (*Larus argentatus*), mew gull (*L. canus*), Western gull (*L. occidentalis*), California gull (*L. californicus*), ring-billed gull (*L. delawarensis*), eared grebe (*Podiceps nigricollis*), western and Clark's grebe (*Aechmophorus occidentalis* and *A. clarkii*),

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41 Ambler, J.W., J.E. Cloern, and A. Hutchinson. 1985. *Seasonal Cycles of Zooplankton from San Francisco Bay* (hereinafter referred to as *Seasonal Cycles of Zooplankton*). *Hydrobiologia* 129:177–197.

42 Ambler, et al., Seasonal Cycles of Zooplankton.

43 Ambler, et al., Seasonal Cycles of Zooplankton.

44 Gewant, D.S. and S. M. Bollens. 2005. Macrozooplankton and Micronekton of the Lower San Francisco Estuary: Seasonal, Interannual, and Regional Variation in Relation to Environmental Conditions *Bay* (hereinafter referred to as *Macrozooplankton and Micronekton in San Francisco Estuary*). Estuaries 28:3 p 473-485.

45 Gewant and Bollens, Macrozooplankton and Micronekton in San Francisco Estuary

46 Residing within the open water column.

47 AMS, Fish Species Inhabiting the Central San Francisco Bay Region.

common loon (*Gavia immer*), Caspian tern (*Hydroprogne caspia*), least tern (*Sternula antillarum*), and California brown pelican (*Pelecanus occidentalis californicus*). Among the diving benthivores guild, canvasback (*Aythya valisineria*), greater scaup (*A. marila*), lesser scaup (*A. affinis*), and surf scooter (*Melanitta perspicillata*) are common.

Marine Mammals

Multiple species of marine mammals are known to occur within San Francisco Bay. The most common, predominant, and likely to be present in waters adjacent the project site include the harbor seal (*Phoca vitulina*) and the California sea lion (*Zalophus californianus*). Other species of marine mammals that are known to occur in San Francisco Bay are less likely to be present in waters adjacent to the project site. The harbor porpoise (*Phocoena phocoena*), although regularly observed inhabiting the waters of the western portion of the Central Bay basin (in and around the Golden Gate and Angel Island), have been observed in recent years as far north as San Pablo and Suisun bays and Yerba Buena Island and the San Francisco-Oakland Bay Bridge to the south.[48,49] Similarly, the northern elephant seal (*Mirounga angustirostris*) has become a regular visitor to the western Central Bay basin, with annual occurrences of individuals being present within San Francisco Bay. In recent years, young elephant seals have been observed at Crissy Field in San Francisco Bay, where they have been recovered by the Marine Mammal Center, and recently a pregnant female was recovered from north San Pablo Bay and relocated to Point Reyes.[50] Although elephant seals are observed within San Francisco Bay more frequently than in past decades, there is no indication that they have taken up residency or are foraging for food within San Francisco Bay waters. The humpback whale (*Megaptera novaengliae*), the California gray whale (*Eschrichtius robustus*), the bottlenose dolphin (*Tursiops truncates)*, and the California sea otter (*Enhydra lutra*) are occasionally observed in San Francisco Bay but are at present relatively rare occurrences.

In general, the presence of marine mammals in San Francisco Bay is related to distribution and presence of prey species and foraging habitat. Additionally, harbor seals and sea lions use

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[48] National Marine Fisheries Service (NMFS), *Harbor Porpoise (*Phocoena phocoena*): San Francisco-Russian River Stock*, 2009. Available online at http://www.nmfs.noaa.gov/pr/sars/2013/po2013_harborporpoise-sfrussianriver.pdf. Accessed October 24, 2014.

[49] NOAA, Taking of Marine Mammals Incidental to Specified Activities; San Francisco – Oakland Bay Bridge Pier E-3 Demolition via Controlled Implosion. 80 FR 44060–44076, July 24, 2015. Available online at https://federalregister.gov/a/2015-18178.

[50] Press *Democrat*, "Elephant seal at highway 37 near San Pablo Bay, captured for relocation." December 29, 2015. Available online at http://www.pressdemocrat.com/news/4991440-181/elephant-seal-at-highway-37?artslide=0. Accessed April 18, 2016.

various intertidal substrates that are exposed at low to medium tide levels for resting and breeding.[51]

Harbor seals and harbor porpoises are the only year-round residents of San Francisco Bay, although sea lions can be observed most of the year. Harbor seals have permanent colonies at Castro Rocks in San Pablo Bay, Yerba Buena Island in the Central Bay basin, and Mowry Slough in the South Bay basin.[52] The current San Francisco Bay harbor seal population is estimated to be between 500 and 700 individuals.[53] Harbor seals forage throughout San Francisco Bay, feeding on schooling fish such as smelt, anchovies, herring, rockfish, sculpin, perch, and midshipmen, along with squid and mysid shrimp, most of which are present in the waters adjacent to the Proposed Project.

Harbor porpoises can be observed in San Francisco Bay at any time of the year, but use both the waters of San Francisco Bay and near-shore coastal waters of Central and Northern California. The harbor porpoise is most commonly observed near the Golden Gate Bridge and open water areas of the western Central Bay basin, although sightings in other areas of San Francisco Bay do occur.[54,55] The San Francisco Bay-Russian River stock of harbor porpoises, identified as a unique genetic group, ranges from Point Arena to Monterey Bay. At present, no accurate estimates of the size of the San Francisco Bay-Russian River population exist.[56] Unlike some of their cousins, harbor porpoises typically avoid boats and humans. Harbor porpoise eat mostly small schooling fish and invertebrates and, along with seals and sea lions, will feed on herring and anchovies.

California sea lions use San Francisco Bay for refuge and foraging but do not breed or pup within the Bay. California sea lions occur within San Francisco Bay in their highest numbers while migrating to and from their primary breeding areas on the Farallon and California Channel islands, and when Pacific herring and salmon inhabit San Francisco Bay waters to spawn or migrate to upriver spawning areas, typically November to March for herring and November to May for salmon. Sea lions are known to swim up into the Delta along with migrating salmon, but most concentrate feeding in the Central Bay basin and where herring spawn. Similar to harbor seals, sea lions haul out onshore, often using structures such as boat docks and navigational buoys, although

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51 NOAA, Report on the Subtidal Habitats.

52 NOAA, Report on the Subtidal Habitats.

53 NOAA, *Report on the Subtidal Habitats*, citing Grigg, E.K., S.G. Allen, D.E. Green, and H. Markowitz, *Harbor Seal*, Phoca vitulina richardii, *Population Trends in the San Francisco Bay Estuary, 1970-2002*, California Fish and Game 90(2):51-70, 2004.

54 Todorov, K., Porpoises playing in Napa River. *Napa Valley Register*, August 3, 2007. Available online at http://napavalleyregister.com/news/local/porpoises-playing-in-napa-river/article_9e95d523-26bf-5a37-9d33-182fb5e97d93.html. Accessed April 19, 2016.

55 Keener W. 2016. Personal communication.

56 NOAA, Report on the Subtidal Habitats.

individuals may also haul out on islands in San Francisco Bay, such as Alcatraz and Angel Island. The largest California sea lion haul-out in San Francisco Bay has been at the Port of San Francisco's Pier 39, where up to 800 sea lions have been counted in the past. Sea lions often float on the surface in large groups of 10 to 20 after feeding.

The California gray whale migrates between its mating/calving grounds in Baja, Mexico, to its primary feeding grounds in Alaska and Canada on an annual basis. Gray whales are commonly sighted offshore of San Francisco Bay during peak migration periods in spring (northward) and winter (southward). North Pacific coastal waters also contain at least three separate populations of humpback whales, of which one inhabits the waters of California, Oregon, and Washington. This population winters in coastal Central America and Mexico and migrates to areas ranging from California to southern British Columbia in summer and fall. When migrating, both humpbacks and California gray whales stay near the surface of the ocean.

California gray whales and humpback whales are infrequent transients into San Francisco Bay, with gray whales potentially present December through April, and humpback whales potentially present April through December. Humpback and California gray whales are both occasional visitors to the San Francisco Bay,[57] with sightings as recent as 2007 for humpbacks when a pair swam up the Sacramento River as far as Sacramento before returning south to San Francisco Bay and the Pacific Ocean.[58]

SENSITIVE NATURAL COMMUNITIES

A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, State, or Federal agencies. Most sensitive natural communities are given special consideration because they perform important ecological functions, such as maintaining water quality and providing essential habitat for plants and wildlife. Some plant communities support a unique or diverse assemblage of plant species and therefore are considered sensitive from a botanical standpoint. The most current version of the CDFW's List of Vegetation Alliances and Associations[59] indicates which natural communities are of special status given the current State of

[57] Green, D.E., E. Grigg, S. Allen, and H. Markowitz, 2006. Monitoring the Potential Impact of the Seismic Retrofit Construction Activities at the Richmond-San Rafael Bridge on Harbor Seals (Phoca vitulinarichardsi) May 1, 1998–September 15, 2005.

[58] Associated Press International (API), "Two Humpback Whales Head Up California River," *Associated Press*, May 17, 2007. Available online at http://www.foxnews.com/story/0,2933,272692,00.html. Accessed March 18, 2011.

[59] California Department of Fish and Game, *List of Vegetation Alliances and Associations*, 2010. Vegetation Classification and Mapping Program, California Department of Fish and Game. Sacramento, California. September 2010.

the California classification. The CDFW formerly tracked sensitive natural communities in the CNDDB. Due to funding cuts, CDFW staff have not added any new occurrences of sensitive natural communities to the CNDDB since the mid-1990s, although the database continues to include those occurrences recorded prior to the program being defunded. The CNDDB reports no sensitive natural community occurrences within the San Francisco North and South U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles containing and surrounding the terrestrial study area.[60] Serpentine soils in California often support unique native flora, of which many species are endemic[61] to this substrate, and therefore are rare or have special status throughout the State. The serpentine rock outcrop of Irish Hill has been heavily disturbed throughout the history of development within the project site, and as a result does not contain the species assemblage that qualifies other serpentine areas as sensitive natural communities.

WETLANDS AND OTHER JURISDICTIONAL WATERS

No wetlands occur in either the marine or terrestrial project study areas; however, the project site is adjacent to San Francisco Bay, which the U.S. Army Corps of Engineers (Corps) classifies as navigable "waters of the U.S." Navigable waters of the U.S. refer to non-wetland aquatic features (other waters) which are regulated by the Federal Clean Water Act (CWA) and are defined under the CWA at Title 33 Code of Federal Regulations (CFR) Part 328.4. To be considered Federally jurisdictional, these features generally must exhibit a defined bed and bank and an ordinary high water mark (OHWM), or be subject to the ebb and flow of the tides. Examples of other waters of the U.S. include rivers, creeks, intermittent and ephemeral[62] channels, ponds, lakes, and the ocean. Waters of the State of California are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (California Water Code Section 13050[e]) and include all Federally jurisdictional waters. Waters of the State are broadly construed to include both public and private waters in natural and artificial channels.

As navigable waters of the U.S., San Francisco Bay is regulated by the Corps under Section 10 of the Rivers and Harbors Act up to mean high water mark, and under Section 404 of the CWA up to the high tide line. These waters are also regulated by the Regional Water Quality Control Board (RWQCB) as Waters of the State. In addition, the San Francisco Bay Conservation and Development Commission (BCDC) regulates the fill, extraction of materials, and substantial changes in use of land, water, and structures within the bay and within 100 feet of the bay shoreline, which includes terrestrial or landside portions of the project site. See Regulatory

[60] California Natural Diversity Database (CNDDB), 2015 Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version. Accessed August 21, 2015.

[61] Native or restricted to a certain area.

[62] A channel that is dry most of the time but flows briefly following rainfall.

Framework on pp. 4.M.33-4.M.45 for more information on Federal and State waters, and BCDC jurisdiction over San Francisco Bay and near-shore areas.

WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors are considered an important ecological resource by the CDFW and USFWS, and under CEQA. Movement corridors may provide favorable locations for wildlife to travel between larger areas of open space referred to as core habitat areas that support foraging, breeding, shelter, and preferred summer and winter range locations. Movement corridors may also function as dispersal corridors that allow animals to move between various locations within their range. Topography and other natural factors, in combination with urbanization, can fragment or separate large open-space areas. Areas of human disturbance or urban development can fragment wildlife habitats and impede wildlife movement between areas of suitable habitat. This fragmentation can create isolated "islands" of vegetation that may not provide sufficient area to accommodate sustainable populations, and can adversely affect genetic and species diversity. Movement corridors mitigate the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange between separate populations. The project site is not considered to be part of an established wildlife movement corridor because it does not provide a connection between two larger core habitat areas.

Although the project site is not within a terrestrial wildlife movement corridor, the San Francisco Peninsula is an important migratory stopover for birds along the Pacific Flyway, one of the four major migratory routes in North America. During fall and spring migrations raptors, songbirds, shorebirds, and waterbirds stop to forage and rest in suitable habitat along this route such as Golden Gate Park, the Presidio, Mount Sutro, Lake Merced, and coastal or bayside beaches. Although the San Francisco Peninsula's location on the Pacific Flyway allows open spaces to host transient individuals, it does not constitute a wildlife movement corridor as these areas are isolated within an otherwise densely developed urban environment. Migrating birds that can forage in intertidal and marine environments may use San Francisco Bay during migration; however, because the terrestrial study area and shoreline are developed/highly disturbed, they do not offer high-quality habitat for migrating birds.

SPECIAL-STATUS AND OTHERWISE PROTECTED SPECIES

A number of species known to occur in either the marine or terrestrial study areas are protected pursuant to Federal and/or State endangered species laws, have been designated species of special concern by the CDFW or NOAA-National Marine Fisheries Service (NMFS), or are afforded certain protection through regulatory means such as the California Department of Fish and Game Code. In addition, Section 15380(b) of the CEQA Guidelines provides a definition of rare,

endangered, or threatened species that are not currently included in an agency listing, but whose "survival and reproduction in the wild are in immediate jeopardy" (endangered) or which are "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens" or "is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the Federal Endangered Species Act."[63] Species recognized under these terms are collectively referred to as "special-status species." For the purpose of this Environmental Impact Report (EIR), special-status species include the following:

1. Species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.12 [listed plants], 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species]).
2. Species that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (61 FR 40, February 28, 1996).
3. Species of "special concern," as designated by USFWS or NOAA-NMFS.
4. Species listed or proposed for listing by the State as threatened or endangered under the California Endangered Species Act (14 Cal. Code Regs. 670.5).
5. Species described by the CDFW as species of special concern. [64]
6. Species designated as "special animals" by the State.[65]
7. Species designated as "fully protected" by the State (there are about 35, most of which are also listed as either endangered or threatened).

[63] For example, the CDFW interprets Ranks 1A, 1B, 2A, and 2B of the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* to consist of plants that, in a majority of cases, would qualify for listing as rare, threatened, or endangered. However, the determination as to whether an impact is significant is made by the lead agency, absent the protection of other laws.

[64] A California species of special concern is one that has been extirpated from the State; meets the State definition of threatened or endangered but has not been formally listed; is undergoing or has experienced serious population declines or range restrictions that put it at risk of becoming threatened or endangered; and/or has naturally small populations susceptible to high risk from any factor that could lead to declines that would qualify it for threatened or endangered status.

[65] Species listed on the current CDFW "special animals" list (October 2015), which includes 905 species. This list includes species that CDFW considers "those of greatest conservation need" (CDFW, *Special Animals List*).

8. Raptors (birds of prey), which are specifically protected by California Fish and Game Code Section 3503.5, thus prohibiting the take, possession, or killing of raptors and owls, their nests, and their eggs.[66]
9. Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.).
10. Species that meet the definitions of rare and endangered under CEQA. CEQA Section 15380 provides that a plant or animal species may be treated as "rare or endangered" even if not on one of the official lists (CEQA Guidelines, Section 15380).
11. Plants considered by the CNPS to be "rare, threatened or endangered in California" under the California Rare Plant Ranking system, which includes Rank 1A, 1B, 2A, and 2B, as well as Rank 3 and 4,[67] plant species.[68]

Lists of special-status plant and animal species that have the potential to occur within the study area for terrestrial biological resources were compiled based on data contained in the CNDDB,[69] the USFWS CalIPaC Trust Report,[70] and the CNPS Inventory of Rare and Endangered Plants[71] for the San Francisco North and South USGS 7.5-minute topographical quadrangles. Marine special-status species were compiled from USFWS, NOAA, and CDFW listings, FR notifications, and assorted published and non-published literature relevant to the marine study area of the Central Bay basin. Several additional species were identified based on the findings of

[66] The inclusion of birds protected by Fish and Game Code Section 3503.5 is in recognition of the fact that these birds are substantially less common in California than most other birds, having lost much of their habitat to development, and that the populations of these species are therefore substantially more vulnerable to further loss of habitat and to interference with nesting and breeding than most other birds. It is noted that a number of raptors and owls are already specifically listed as threatened or endangered by State and Federal wildlife authorities.

[67] Rank 3 plants may be analyzed under CEQA Guidelines Section 15380 if sufficient information is available to assess potential impacts to such plants. Factors such as regional rarity vs. Statewide rarity should be considered in determining whether cumulative impacts to a Rank 4 plant are significant even if individual project impacts are not. California Rare Plant Ranking system (CRPR) Ranks 3 and 4 may be considered regionally significant if, for example, the potentially impacted occurrence is located at the periphery of the species' range, or exhibits unusual morphology, or occurs in an unusual habitat/substrate. For these reasons, CRPR Ranks 3 and 4 plants should be included in the special-status or otherwise protected species analysis. Ranks 3 and 4 plants are also included in the CNDDB Special Vascular Plants, Bryophytes, and Lichens List. The current online published list is available at: http://www.dfg.ca.gov/biogeodata. (CDFW, Natural Diversity Database. July 2015. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. 125 pp.)

[68] CRPR rankings are defined in detail in Regulatory Framework on p. 4.M.40.

[69] CNDDB, 2015 Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version. Accessed August 21, 2015.

[70] USFWS, 2015 My Project, IPaC Trust Resource Report of Federally Endangered and Threatened Species in the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, August 20, 2015.

[71] California Native Plant Society (CNPS), 2015, Inventory of Rare and Endangered Plants for San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles. Available online at http://www.rareplants.cnps.org/. Accessed August 21, 2015.

technical reports and environmental literature. Locally significant plants are incorporated herein based on a list produced by the Yerba Buena Chapter of CNPS that identifies locally rare plants with extant populations identified in the project vicinity.[72] Lists for terrestrial and marine species that may occur in the project study areas are addressed separately. Three tables in Appendix E (Table E-1: Special-Status or Otherwise Protected Plant Species that May Occur in the Study Area, Table E-2: Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area, and Table E-3: Special-Status Fish and Marine Mammals that May Occur within the Bay Waters of the Project Area) present the special-status species considered in the analysis, including each species' legal or protective status, habitat requirements, and blooming period (for plants), and the potential for occurrence within either the terrestrial or marine project study areas. Figure M.1 in Appendix E identifies the locations of regional special-status species occurrences as reported in the CNDDB within 5 miles of the project site.

Species designations regarding the likelihood of occurrence were assigned based on a review of the biological literature of the region, information presented in previous environmental documentation, and an evaluation of the habitat conditions of the study area. A species was designated to have "no potential" to occur if (1) its specific habitat requirements (e.g., serpentine grasslands, as opposed to grasslands occurring on other soils) are not present; or (2) it is presumed to be extirpated from the project area or region based on the best scientific information available. A species was designated as having a "low" potential for occurrence if (1) its known current distribution or range is outside of the study area; or (2) only limited or marginally suitable habitat is present within the study area. A species was designated as having a "moderate" potential for occurrence if (1) there is low to moderate quality habitat present within the study area or immediately adjacent areas; or (2) the study area is within the known range of the species, even though the species was not observed during biological surveys. A species was designated as having a "high" potential for occurrence if (1) moderate to high quality habitat is present within the study area; and (2) the study area is within the known range of the species. A species was designated as "present" if it was observed within the project site during reconnaissance or focused surveys.

Special-Status Plants

The special-status or otherwise protected plant species identified in Appendix E, Table E-1 are considered to have either no potential to occur in the terrestrial study area or a low potential to occur in the terrestrial study area due to the heavily disturbed nature of the project site and corresponding absence of suitable habitat. No special-status plant species were observed during

[72] CNPS, Yerba Buena Chapter, 2015, List of Locally Significant Plants for San Francisco County. Available online at http://www.cnps-yerbabuena.org/experience/plant_guides.html?jumpToGuide=0 Information. Accessed August 21, 2015.

the August 20, 2015, terrestrial biological resources reconnaissance survey of the project site. Several special-status plant species with affinity to serpentine soils that have some known occurrences in disturbed, rocky, weedy habitats were considered to have potential to occur on Irish Hill due to the serpentine geology of the feature and historical presence of such species in the region. Potential habitat for rare plants does not occur within the terrestrial study area outside of the Irish Hill remnant of the project site. CDFW protocol-level[73] rare plant surveys of Irish Hill were conducted in the spring of 2016 during blooming periods of suspected species to determine if any special-status plants occupied Irish Hill. No special-status plant species were observed during the rare plant surveys of Irish Hill on March 30 and May 3, 2016,[74] and the surveying botanist concluded that the historical disturbance to Irish Hill and resulting composition of non-native or invasive species displaced any remaining suitable serpentine habitat for rare plants. No special-status plants are considered to have even a moderate potential to occur within the terrestrial study area and are not considered further in this analysis.

Special-Status Terrestrial Animals

Many of the special-status terrestrial animals identified in Appendix E, Table E-2 have no potential to occur in the terrestrial study area or a low potential to occur in the terrestrial study area due to the absence of suitable habitat preferred by the species or necessary for their survival. Double-crested cormorant, a California species of special concern, was observed in San Francisco Bay during the biological resources reconnaissance survey conducted August 20, 2015, and other special-status bird and bat species have the potential to occur in the terrestrial study area. Only those special-status species known to occur within the study area or considered to have at least a moderate potential to occur in the study area were considered in the impact analysis; these species are described below.

The following groups of terrestrial special-status animals have at least a moderate potential to occur in the terrestrial study area:

- Special-Status Birds
- Other Resident and Migratory Birds
- Special-Status Bats

[73] CDFG, Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities, California Natural Resources Agency, November 24, 2009.

[74] ESA, Pier 70 Mixed-Use Development Project: Results of the March 30, 2016 and May 3, 2016, Irish Hill Rare Plant Surveys, May 2016.

Special-Status Birds

The following birds are State or Federal listed as endangered or threatened, fully protected, recently delisted, or on a watch list. Species considered Birds of Conservation Concern by the USFWS, Species of Special Concern by CDFW, or species that occur on the CDFW Special Animals List are also discussed.

AMERICAN PEREGRINE FALCON

The American peregrine falcon (*Falco peregrines anatum*) is a California fully protected species that is regularly observed in the study area.[75] The American peregrine falcon nests on cliff ledges in natural environments, but it has adapted to nesting on shelves of tall buildings or structures in urban environments.[76] The Santa Cruz Predatory Research Group has been closely following a successful breeding pair of peregrines who nested on a ledge of the 33rd floor of the Pacific Gas & Electric building on Beale Street in San Francisco from 2005 to 2014. This raptor commonly hunts other birds in flight from perches or from high in the air. Although peregrines typically prefer to nest in taller buildings, it is possible that they could nest in one of the multi-story buildings on the site. American peregrine falcon nesting has not been documented or observed on site, though they may forage in the study area.

CALIFORNIA GULL

The California gull, formerly a State Species of Special Concern due to declining numbers in their historical breeding population at Mono Lake, is on the CDFW Watch List. Nesting colonies in California are still considered to be of conservation concern by CDFW, even though the species has established large breeding colonies in the San Francisco Bay Area.[77] The California gull is a medium-sized gull with a yellow bill with a black ring, and yellow legs. The species breeds primarily at lakes and marshes in interior western North America from Canada south to eastern California and Colorado.[78] Birds that breed inland are migratory, most moving to the Pacific coast in winter. More recently, the species has been breeding in large numbers at the salt

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75 eBird, An online database of bird distribution and abundance [web application]. Agua Vista Park Hotspot. eBird, Ithica, New York. Available online at http://www.ebird.org. Accessed September 28, 2015.

76 Sibley, David A., 2003, *The Sibley Guide to Birds*. National Audubon Society. Alfred A. Knopf, New York.

77 Ackerman, J.T., J.Y. Takekawa, C. Strong, N. Athearn, and A. Rex, *California Gull Distribution, Abundance, and Predation on Waterbird Eggs and Chicks in South San Francisco Bay, Final Report* (hereinafter referred to as *California Gull Report*), U.S. Geological Survey, Western Ecological Research Center, Davis and Vallejo, California, 61 pp.

78 Sibley, David A., 2003, *The Sibley Guide to Birds.* National Audubon Society. Alfred A. Knopf, New York, 215 pp.

ponds of south San Francisco Bay. They nest in colonies, sometimes with other bird species. The nest is a shallow depression on the ground lined with vegetation and feathers. The female usually lays two or three eggs, and both parents feed the young birds. California gulls forage in flight or pick up objects while swimming, walking, or wading and primarily eat insects, fish, and eggs. They also scavenge at garbage dumps or docks. California gulls may have negative effects on other ground-nesting birds and are significant predators on American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), and western snowy plover (*Charadrius nivosus* ssp. *nivosus*) eggs and chicks.[79] California gull forage in San Francisco Bay but are not expected to nest on the project site due to the lack of historic nesting at the site, the absence of suitable nesting habitat, and the constant presence of people in the parking lots and buildings adjacent to the shoreline.

OSPREY

The osprey (*Pandion haliaetus*) is a former California Species of Special Concern, and nesting osprey are on the CDFW Watch List. Osprey are also protected under Section 3503.5 of the California Fish and Game Code. These large fish-eating raptors can be found around nearly any water body, including salt marshes, rivers, ponds, reservoirs, estuaries, and oceans. Historically, ospreys nested throughout much of California, but by the 1960s much of the osprey population declined in the central and southern California areas. This decline was attributed to human persecution, habitat alteration, and DDT use. The osprey prefers to nest within sight of permanent water and readily builds its nest on human-made structures, such as telephone poles, channel markers, duck blinds, and nest platforms designed especially for it. A nesting pair bred successfully on top of a crane located at Pier 80 in 2012, south of the project site.[80] Marginal nesting structures for osprey occur within the project site, and foraging habitat is present within San Francisco Bay.

CALIFORNIA BROWN PELICAN

A State Fully Protected Species, brown pelicans occur in estuarine, marine subtidal, and marine pelagic waters throughout coastal California.[81] Important habitat for pelicans during the nonbreeding season includes roosting and resting areas, such as offshore rocks, islands, sandbars, breakwaters, and pilings. Suitable areas need to be free of disturbance. This species rests temporarily on the water or isolated rocks, but roosting requires a dry location near food and a buffer from predators and humans. The California brown pelican is a common post-breeding

[79] Ackerman et al., *California Gull Report.*

[80] Golden Gate Audubon Society, Osprey Chick Hatches on Top of Maritime Crane in San Francisco's First Documented Osprey Birth. Press release, July 1, 2012.

[81] Zeiner D.C., W.F. Laudenslayer, Jr., K.E. Mayer, M. White, 1990, *California's Wildlife Volume II, Birds*, California Department of Fish and Game, California brown pelican.

resident (May through November) of the open waters of central San Francisco Bay. Nesting habitat does not occur on the project site; San Francisco Bay is located outside of the species' breeding range, which is limited to the Channel Islands south to central Mexico. Brown pelican presence within or near the project site would be limited to loafing on decapitated piers or bulkheads and foraging in the Bay and adjacent environs.

DOUBLE-CRESTED CORMORANT

The double-crested cormorant is a Species of Special Concern in California. A year-round resident along the entire coast of California, the species is common along the coast and in estuaries and salt ponds. They forage mainly on fish, crustaceans, and amphibians. These birds sometimes feed cooperatively in flocks of up to 600, often with pelicans, and nest in colonies of a few to hundreds of pairs.[82] There are breeding colonies on Alcatraz, Yerba Buena Island, and the old eastern span of the Bay Bridge. The species forages in San Francisco Bay. Although unlikely, the species has the potential to nest on the dilapidated piers northeast of the project site.

CASPIAN TERN

Caspian terns are considered a Bird of Conservation Concern by USFWS, and their nesting areas are protected. This species is common along the California coast and at scattered locations inland. They nest in colonies from April through early August on sandy estuarine shores, on levees in salt ponds, and on islands in alkali and freshwater lakes. Breeding adults often fly substantial distances to forage in lacustrine,[83] riverine, and fresh and saline emergent wetland habitats. They have successfully nested at Piers 60 and 64, north of the project site.[84]

Other Resident and Migratory Birds

Although many native birds are not considered to be special-status species, their nests are protected by the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code. Many resident and migratory birds could nest in ruderal vegetation, eucalyptus trees, on or in buildings within the study area, as well as on the dilapidated piers off shore of the project site. Western gulls have been documented nesting at Piers 60 and 64,[85] north of the project site, and could nest on dilapidated piers northeast of the project site. Raptor species, such as great horned owl (*Bubo virginianus*), red-tailed hawk, and red-shouldered hawk, could build a nest in the stand

[82] Zeiner et al., 1990, *California's Wildlife Volume II, Birds*, California Department of Fish and Game, Double-crested cormorant.
[83] Habitat surrounding inland depressions or dammed riverine channels containing standing water (i.e. a lake).
[84] Weeden, N., and M. Lynes, Summary Report of Avian Surveys Conducted in 2008
[85] Weeden, N., and M. Lynes, Summary Report of Avian Surveys Conducted in 2008.

of mature eucalyptus adjacent to Irish Hill. Cliff swallow, barn swallow (*Hirundo rustica*), and black phoebe (*Sayornis nigricans*) could build mud nests on the outside of existing buildings and barn owls may nest inside of existing buildings at the project site. Other passerine species, such as house finch and Anna's hummingbird, could build nests in shrubs or trees in the study area, while killdeer (*Charadrius vociferous*) and mourning dove build nests on the ground. Great blue heron (*Ardea Herodias*) and shorebirds such as sanderling, western sandpiper, and spotted sandpiper could also frequent the exposed shoreline along the northeastern boundary of the site to forage while migrating or overwintering in the Bay Area.

Special-Status Bats

Two special-status bat species have at least a moderate potential to roost within the project study area: Pallid bat (*Antrozous pallidus*), considered a California Species of Special Concern by CDFW, and Yuma myotis (*Myotis yumanensis*), considered a California special animal by CDFW. Suitable roosting habitat for these bats is open spaces, cracks, and crevices; within buildings; in tree foliage; underneath the exfoliating bark of trees; and in tree cavities, all of which occur within the project site. Bat surveys conducted in 2009 of San Francisco's parks and natural areas found that the three most commonly encountered species in the area are Mexican free-tailed bat (*Tadarida brasiliensis*), Yuma myotis, and western red bat (*Lasiurus blossevillii*).[86] Mexican free-tailed bats, which have no special status, were widespread and abundant throughout the sampled natural areas and the only species documented in the Krauel study sample sites closest to the project site including Buena Vista Park (approximately 2 miles southwest) and Bayview Park (approximately 3 miles south).[87] Yuma myotis and western red bat were much less abundant and generally were restricted to parks with lakes. Suitable roosting habitat for Pallid bat, Yuma myotis, and common bat species is present in the project area.

Special-Status Fish and Marine Mammals

Specific individual species in the following groups of marine special-status animals have at least a moderate potential to occur in the marine study area:

- Special-Status Fish Species
- Special-Status Marine Mammals
- Managed U.S. Fisheries Species
- Other Special-Status Marine Species

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[86] Krauel, J.K., *Foraging Ecology of Bats in San Francisco*. M.S. Thesis, San Francisco State University. San Francisco, California. August 2009.

[87] Krauel, J.K., *Foraging Ecology of Bats in San Francisco*.

The special-status marine species list presented in Appendix E, Table E-3 includes those taxa for which potential habitat (i.e., general habitat types for breeding or foraging) has been observed to occur within the general vicinity of the project site and can be reasonably expected to be affected by project activities. Species for which generally suitable habitat occurs but that were nonetheless determined to have low potential to occur in the project area are also listed in Appendix E, Table E-3. This table provides the rationale for each potential-to-occur determination. Species observed or with a moderate to high potential to occur in the marine project study area (i.e., the San Francisco Bay Waters of the Project Area) are discussed in further detail below.

Special-Status Fish

GREEN STURGEON

Green sturgeon, an anadromous[88] fish, is the most widely distributed member of the sturgeon family and the most marine-oriented of the sturgeon species. It is listed as a Federal threatened species and as a State species of special concern. Green sturgeons (*Acipenser medirostris*) range in near-shore coastal waters from Mexico to the Bering Sea, and are common occupants of bays and estuaries along the western coast of the United States.[89] Adults in the San Joaquin Delta are reported to feed on benthic invertebrates including shrimp, amphipods, and occasionally small fish,[90] while juveniles have been reported to feed on opossum shrimp and amphipods. Adult green sturgeons migrate into fresh water beginning in late February, with spawning occurring in March through July and peak activity in April and June. After spawning, juveniles remain in fresh and estuarine waters for one to four years and then begin to migrate out to the sea.[91] The upper Sacramento River has been identified as the only known spawning habitat for green sturgeon in the southern distinct population segment. Critical habitat for the green sturgeon includes the Sacramento River, the Sacramento-San Joaquin Delta, and Suisun, San Pablo and San Francisco bays.[92] This includes the waters adjacent to Pier 70.

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88 Anadromous fish are those migrating from the sea to fresh water to spawn.

89 Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake, *Fish Species of Special Concern of California, Second Edition* (hereinafter referred to as *Fish Species of Special Concern*), University of California, Davis, Department of Wildlife and Fisheries Biology, prepared for the California Department of Fish and Game, Rancho Cordova, CA, June 1995.

90 Moyle, et al., Fish Species of Special Concern.

91 Moyle, et al., Fish Species of Special Concern.

92 NOAA, "Endangered and Threatened Wildlife and Plants: Final Rulemaking to Designate Critical Habitat for the Threatened Southern District Population Segment of North American Green Sturgeon," *Federal Register* 74(195):52300–52351, October 9, 2009.

LONGFIN SMELT

Longfin smelt is a State-listed endangered species and is currently under reconsideration as a special-status species by the USFWS.[93] The longfin smelt is a pelagic schooling fish known to inhabit the San Francisco Bay, including all of the waters of the Central Bay basin including the waters in and adjacent to Pier 70, along the west shoreline of Treasure Island, and in the Central Bay basin.[94, 95] Although observed in Central Bay basin waters throughout the year, longfin smelt migrate to the fresher water of the Delta to spawn in the winter, returning to San Francisco Bay waters in late spring. No critical habitat has been designated for this species.

PACIFIC HERRING

Pacific herring is neither a protected species under the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA), nor a managed fish species under the Fishery Conservation and Management Act (Magnuson-Stevens Act). Pacific herring does, however, represent a species of special concern for San Francisco Bay since it is an important member of the San Francisco Bay marine ecosystem; provides an important food source for marine mammals, sea birds, and fish; and constitutes a State fishery that is entirely conducted within an urban estuary, making it particularly susceptible to human-caused impacts. As a State fishery it is regulated under Sections 8550 through 8559 of the California Fish and Game Code.

Pacific herring are found throughout the coastal zone from northern Baja California northward around the rim of the North Pacific Basin to Korea. In California, herring forage offshore during spring and summer and then migrate inshore to bays and estuaries to spawn October through April. Known spawning areas in California include San Diego Bay, San Luis River, Morro Bay, Elkhorn Slough, San Francisco Bay, Tomales Bay, Bodega Bay, Russian River, Noyo River, Shelter Cove, Humboldt Bay, and Crescent City Harbor.[96] The largest spawning aggregations in California occur in San Francisco and Tomales bays. Most spawning areas are characterized as having reduced salinity with calm and protected waters. Spawning substrate such as submerged aquatic vegetation beds, especially eelgrass beds, or rocky intertidal areas are preferred, but human-made structures such as pier pilings and riprap are also frequently used spawning

[93] USFWS, "Endangered and Threatened Wildlife and Plants; Initiation of Status Review for Longfin Smelt," *Federal Register* 76(47), March 10, 2011.

[94] Interagency Ecological Program for the San Francisco Bay Estuary (IEP), *San Francisco Bay Study, 2009-2013*, unpublished raw midwater trawl data, 2009-2013.

[95] IEP, *San Francisco Bay Study, 2009-2013*, unpublished raw bottom trawl data, 2009-2013.

[96] Bartling, R., *Pacific Herring – Status of the Fisheries Report*, prepared for the California Department of Fish and Game, 2006 (hereinafter referred to as *Pacific Herring Report*). Available online at http://www.dfg.ca.gov/marine/status/report2006/herring.pdf. Accessed March 22, 2011.

substrates in San Francisco Bay.[97] Key spawning areas within San Francisco Bay include the eelgrass beds in Richardson Bay and along Point Pinole, and the artificial infrastructure of the Port of San Francisco. The waterfront area of the project site has been identified as a herring spawning location.[98] CDFW reported herring spawning occurring along the waterfront of the project site during the 2012-2013 and 2014-2015 spawning seasons.[99,100] No reported spawning occurred during the 2013-2014 spawning season at the project site.[101] After hatching, herring fry and juveniles use nearby protected inshore waters for rearing habitat.[102]

Special-Status Marine Mammals

HARBOR SEAL

The harbor seal is a permanent resident in San Francisco Bay and is routinely seen in waters near the project site. Harbor seals are protected under the Marine Mammal Protection Act (MMPA). They have been observed as far upstream in the Delta and Sacramento River as the City of Sacramento, though their use of the habitat north of Suisun Bay is irregular.[103]

The closest location to the project site where harbor seals are known to haul out year-round is on the southeastern side of Yerba Buena Island, on U.S. Coast Guard (USCG) property. Individual seals may occasionally haul out farther to the west and southwest of the main haul-out site, depending on space availability and conditions at the main haul-out area. Harbor seals feed in the deepest waters of San Francisco Bay, with the region from the Golden Gate Bridge east to Treasure Island and south to the San Mateo Bridge being the principal feeding sites.[104] Harbor seals feed on a variety of fish, such as perch, gobies, herring, and sculpin.

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97 Bartling, Pacific Herring Report.

98 CDFW Herring Data as Reported by WRA, Inc. Available online at https://gis.wra-ca.com/herring/.

99 CDFW 2013. Summary of the 2012-2013 Pacific Herring Spawning Population and Commercial Fisheries in San Francisco Bay. November 2013.

100 CDFW 2015. Summary of the 2014-2015 Pacific Herring Spawning Population and Commercial Fisheries in San Francisco Bay. September 2015.

101 CDFW 2014. Summary of the 2013-2014 Pacific Herring Spawning Population and Commercial Fisheries in San Francisco Bay. July 2014.

102 Lassuy, D.R., Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Northwest)--Pacific herring, USFWS Biol. Rep. 82(11.126), U.S. Army Corps of Engineers, TR-EL-82-4.18 pp., 1989.

103 Goals Project, 2000, Baylands Ecosystem Species and Community Profiles, Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, ed. San Francisco Bay Regional Water Quality Control Board, Oakland, California.

104 Kopec, D., and J. Harvey, 1995, Toxic Pollutants, Health Indices, and Population Dynamics of Harbor Seals in San Francisco Bay, 1989-91: A Final Report. Technical publication. Moss Landing, California: Moss Landing Marine Labs.

CALIFORNIA SEA LION

Like the harbor seal, the California sea lion is a permanent resident in San Francisco Bay and protected by the MMPA. A common, abundant marine mammal, they are found throughout the West Coast, generally within 10 miles of shore. They breed in southern California and the Channel Islands, and then migrate up the Pacific coast to the Bay. They haul out on offshore rocks, sandy beaches, and onto floating docks, wharfs, vessels, and other human-made structures in the Bay and coastal waters. California sea lions feed on a wide variety of seafood, mainly squid and fish and sometimes even clams. Commonly eaten fish and squid species include salmon, hake, Pacific whiting, anchovies, herring, schooling fish, rockfish, lamprey, dog fish, and market squid.[105] California sea lions may forage in the waters of and adjacent to the project site.

Managed U.S. Fisheries Species

Under the Magnuson-Stevens Act (see Regulatory Framework, pp. 4.M.36–4.M.37, for a description), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), NMFS, Fishery Management Councils, and Federal agencies are required to cooperatively protect essential fish habitat for commercially important fish species such as Pacific coast groundfish, three species of salmon, and five species of coastal pelagic fish and squid. As defined by Congress, essential fish habitat includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Those fish species present in the Central Bay basin included in Fishery Management Plans prepared by regional Fishery Management Councils under the Magnuson-Stevens Act are listed in Appendix E, Table E-4.

Other Special-Status Marine Species

NATIVE OLYMPIA OYSTERS

The Olympia oyster (*Ostrea lurida*), also known as the "native oyster," is native to most of western North America, and it was a key component of the San Francisco Bay marine ecosystem prior to overharvesting and increased siltation from hydraulic mining in the mid-nineteenth century.[106] Thought to have gone extinct in San Francisco Bay, Olympia oysters have been observed slowly reestablishing their presence in San Francisco Bay since 2000. Because of its special importance as a keystone species in the Bay, the restoration and reestablishment of

[105] Southwest Fisheries Science Center, "Sea Lion Diet," 2011. Available online at: http://swfsc.noaa.gov/textblock.aspx?Division= PRD&ParentMenuId=148&id=1252. Accessed March 18.

[106] NOAA, Habitat Connections, Restoring the Olympia Oyster (*Ostrea conchaphila = lurida*), Volume 6, Number 2, 2008 (hereinafter referred to as Habitat Connections). Available online at http://www.oyster-restoration.org/wp-content/uploads/2012/06/OlympiaOysterHabitatConnections.pdf, 2008. Accessed August 26, 2015.

Olympia oysters in San Francisco Bay has become an important component of the overall resource management and restoration of San Francisco Bay by NOAA-NMFS and CDFW.[107]

Olympia oysters inhabit brackish water conditions but prefer salinities above 22 parts per thousand. In their natural state, Olympia oysters form sparse to dense beds in coastal bays and estuaries and in drought conditions will move up into channels and sloughs, dying off when wetter conditions return. Olympia oysters are not reef builders like their East and Gulf Coast cousin, *Crassostrea virginica*. Olympia oysters are known to provide high biodiversity habitat because they provide physical habitat structure sought by juvenile fish and crustaceans, worms, and foraging fish and birds.[108] They also stabilize sediment, reduce suspended sediment, and improve light penetrations, thereby improving the physical conditions that encourage the establishment of submerged aquatic vegetation, such as eelgrass beds. Additionally, a robust population of filter feeders can help modulate plankton blooms.[109]

Naturally occurring populations of native oysters can be found throughout San Francisco Bay on natural and artificial hard substrate from Carquinez Strait to the South Bay. Intertidally they occur between Point Pinole to south of the Dumbarton Bridge, with the highest reported abundances of 80 per square meter in the Central Bay basin.[110] Oysters have appeared to do well subtidally in many human-made habitats such as on marina floats and in tidally restricted ponds, lagoons, and saline lakes. Native oysters have been reported inhabiting the intertidal and subtidal rocks comprising the riprap shoreline of Treasure Island,[111] on wharf pilings of the Port of San Francisco,[112] and in the intertidal areas of the project site.[113] Although thought to be extinct from San Francisco Bay since the mid-nineteenth century, native oysters have been observed in various locations in San Francisco Bay since 2000.[114] Their presence in other rocky intertidal, rocky subtidal, and human-made habitats in Central Bay basin is expected.

Threats to Olympia oysters include predation from indigenous and non-native marine snails (*Acanthina spirata* and *Urosalpinx cinerea*, respectively), birds, bat rays, and crabs. Limited

[107] NOAA, Report on the Subtidal Habitats.
[108] NOAA, Habitat Connections.
[109] NOAA, Habitat Connections.
[110] San Francisco Bay Subtidal Habitat Goals Report, Appendix 7-1: Shellfish Conservation and Restoration in San Francisco Bay: Opportunities and Constraints (hereinafter referred to as *Shellfish Conservation and Restoration)*, September 17, 2010. Available online at http://www.sfbaysubtidal.org/report.html.
[111] AMS, Survey of Intertidal Habitat.
[112] AMS, Technical Memo: Reconnaissance Survey of the Intertidal Marine Community Inhabiting Pier Pilings at the Port of San Francisco, March 22, 2011. Prepared for ESA and the Port of San Francisco in support of the AC34 CEQA analysis.
[113] AMS, Intertidal Habitat and Biological Community Survey
[114] Shellfish Conservation and Restoration.

suitable hard substrate and physical water quality conditions are also important parameters.[115] Olympia oysters do not appear to prosper in areas of high siltation.

CRITICAL HABITAT

The USFWS and NMFS designate critical habitat for species that they have listed as threatened or endangered. "Critical habitat" is defined in Section 3(5)(A) of the FESA as those lands (or waters) within a listed species' current range that contain the physical or biological features that are considered essential to the species' conservation, as well as areas outside the species' current range that are determined to be essential to its conservation. Critical habitat may include an area that is not currently used by an endangered or threatened species but that will be needed for species recovery.

A review of GIS-based habitat data for *USFWS Critical Habitat for Threatened and Endangered Species* shows that the project site is not located within designated critical habitat for any listed species.[116] Critical habitat for green sturgeon and Central California coast steelhead is designated in San Francisco Bay and includes the waters adjacent to the project site. Critical habitat for Franciscan manzanita (*Arctostaphylos franciscana*) occurs approximately 3 miles east of the project site.

REGULATORY FRAMEWORK

This section briefly describes Federal, State, and local regulations, permits, and policies pertaining to biological resources found on or in the vicinity of the Proposed Project.

FEDERAL REGULATIONS

Federal Endangered Species Act

The FESA (16 United States Code [USC] Section 1531 et seq.) designates threatened and endangered animal and plant species, and provides measures for their protection and recovery. The "take" of listed plant or wildlife species, defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct," is prohibited without first obtaining a Federal permit. Harm includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Activities that damage (i.e., harm) the habitat of listed wildlife species require approval from the USFWS or NMFS. The FESA also generally requires determination of critical habitat for listed species. If critical habitat has been designated,

[115] Shellfish Conservation and Restoration.
[116] USFWS Critical Habitat Portal available online at http://ecos.fws.gov/crithab/.

impacts to areas that contain the primary constituent elements identified for the species, whether or not it is currently present, are also prohibited. FESA Section 7 (for actions by Federal agencies) and Section 10 (for actions by non-Federal agencies) provide two pathways for obtaining authority to take listed species. Federal agency actions include activities on Federal land or that are conducted by, funded by, or authorized by a Federal agency (including issuance of Federal permits and licenses).

For projects that require a Federal permit (e.g., from the Corps for effects to jurisdictional other waters, as would be the case for the Proposed Project), the lead Federal agency is required by the FESA (under Section 7) to ensure that any action they authorize, implement, or fund will not jeopardize the continued existence of any Federally threatened or endangered species or destroy or adversely modify designated critical habitat. Under FESA Section 7 consultation, the lead Federal agency (e.g., the Corps) submits a biological assessment (BA) that analyzes whether the project is likely to adversely affect listed wildlife or plant species or their critical habitat, and proposes suitable avoidance, minimization, or compensatory mitigation measures. If the action would adversely affect the species, the USFWS then responds to the BA by issuing its biological opinion (BO) determining whether the project is likely to adversely affect the species to the extent that it would jeopardize the species or result in adverse modification of critical habitat.

If a "non-jeopardy" or "no adverse modification" opinion is provided by the USFWS, the Federal agency may proceed with the action as proposed. If a jeopardy or adverse modification opinion is provided, the USFWS may prepare a BO that specifies reasonable and prudent measures to minimize take and associated mandatory terms and conditions that describe the methods for accomplishing these prudent measures and/or also develop mandatory reasonable and prudent alternatives to the proposed action.

Migratory Bird Treaty Act

The Federal MBTA (16 USC, Section 703, Supp. I, 1989) prohibits pursuit, take or attempt to take, killing, possessing, selling, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act applies to whole birds, parts of birds, and bird nests and eggs. For projects that would not result in the direct mortality of birds, the MBTA is generally also interpreted in CEQA analyses as protecting active nests of all species of birds that are on the List of Migratory Birds, published in the Federal Register in 1995. With respect to nesting birds, although the MBTA itself does not provide specific take avoidance measures, the USFWS and CDFW over time have developed a set of measures sufficient to demonstrate take avoidance. These requirements include avoiding vegetation removal or ground disturbance during nesting season (January 15 – August 15), conducting preconstruction nesting bird surveys of a project area during nesting season, and establishing appropriately-sized protective buffers from construction if active nests are found.

Marine Mammal Protection Act

The MMPA of 1972, and as amended in 1981, 1982, 1984, and 1995, establishes a Federal responsibility for the protection and conservation of marine mammal species by prohibiting the harassment, hunting, capture, or killing of any marine mammal. The primary authority for implementing the act belongs to the USFWS and NOAA Fisheries.

Federal Regulation of Wetlands and Other Waters

The Corps, acting under the U.S. Environmental Protection Agency (EPA), regulates the filling of wetlands and other "waters of the U.S." The Corps has primary Federal responsibility for administering regulations that concern waters and wetlands in the project area under statutory authority of the Rivers and Harbors Act (Sections 9 and 10) and the CWA (Section 404).

Pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC 403), the Corps regulates the construction of structures in, over, or under, excavation of material from, or deposition of material into "navigable waters." Navigable waters under the act are those "subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 CFR Section 3294). In tidal areas, the limit of navigable water under Section 10 is the elevation of mean high water mark; in nontidal waters it is the ordinary high water mark. Larger streams, rivers, lakes, bays, and oceans are examples of navigable waters regulated under Section 10 of the Rivers and Harbors Act. Typical activities requiring Section 10 permits are construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, and cable or pipeline crossings; and dredging and excavation. Section 10 of the Federal Rivers and Harbors Appropriations Act (30 Stat. 1151, codified at 33 USC Sections 401, 403) also prohibits the unauthorized obstruction or alteration of any navigable water (33 USC Section 403).

Section 404 of the Federal CWA (33 USC 1251–1376) prohibits the discharge of dredged or fill material into waters of the U.S., including wetlands, without a permit from the Corps. The jurisdiction of the Corps in tidal waters under Section 404 extends to the high tide line or high tide mark, simply indicating a point on the shore where water reaches a peak height at some point each year. The CWA prohibits the discharge of any pollutant without a permit. Implicit in the CWA definition of "pollutant" is the inclusion of dredged or fill material regulated by Section 404 (22 USC 1362). The discharge of dredged or fill material typically means adding into waters of the U.S. materials such as concrete, dirt, rock, pilings, or side-cast material for the purpose of replacing an aquatic area with dry land or raising the elevation of an aquatic area. Activities typically regulated under Section 404 include the use of construction equipment such as bulldozers, and the leveling or grading of sites where jurisdictional waters occur.

National Invasive Species Act

Under the National Invasive Species Act of 1996, the USCG established national voluntary ballast water guidelines. The USCG published regulations on June 14, 2004, establishing a national ballast water management program with mandatory requirements for all vessels equipped with ballast water tanks that enter or operate in U.S. waters. The regulations carry mandatory reporting requirements to aid in the USCG's responsibility, under the National Invasive Species Act, to determine patterns of ballast water movement. The regulations also require ships to maintain and implement vessel-specific ballast water management plans.

Estuary Protection Act (16 USC 1221–1226)

The Estuary Protection Act highlights the value of estuaries and the need to conserve their valuable natural resources. It authorizes the Secretary of the Interior, in cooperation with other Federal agencies and the states, to study and inventory estuaries of the United States and to determine whether any areas should be acquired by the Federal government for future protection.

Under this act, the Secretary of the Interior is required to review all project plans and reports for land and water resource development affecting estuaries and make an assessment of likely impacts and related recommendations for conservation, protection, and enhancement of estuaries.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act (16 USC 1801−1884) of 1976, as amended in 1996 and reauthorized in 2007, applies to fisheries resources and fishing activities in Federal waters that extend to 200 miles offshore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the legislation.

The Magnuson-Stevens Act defines "essential fish habitat" as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The act, as amended through 2007, sets forth a number of new mandates for NOAA Fisheries, regional Fishery Management Councils, and Federal action agencies to identify essential fish habitat and to protect important marine and anadromous fish habitat. The Magnuson-Stevens Act provided NOAA Fisheries with legislative authority to regulate fisheries in the United States in the area between 3 miles and 200 miles offshore and established eight regional Fishery Management Councils that manage the harvest of the fish and shellfish resources in these waters. The councils, with assistance from NOAA Fisheries, are required to develop and implement Fishery Management Plans (FMPs), which include the delineation of essential fish habitat for all managed species. An FMP is a plan to achieve specified management goals for a fishery and is comprised of data, analyses, and management measures. Essential fish habitat that is identified in an FMP applies to all fish species managed by that FMP, regardless of whether the species is a protected species or

not. Federal agency actions that fund, permit, or carry out activities that may adversely affect essential fish habitat are required under Section 305(b), in conjunction with required Section 7 consultation under FESA, to consult with NOAA Fisheries regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to NOAA Fisheries' recommendations.

The waters of the Central Bay basin of San Francisco Bay are designated as essential fish habitat for fish managed under three FMPs. In total, 13 species of commercially important fish and sharks managed in the Pacific Coast Groundfish and Coastal Pelagic Species FMPs use this region of San Francisco Bay as either essential fish habitat or a habitat area of particular concern. In addition, the Pacific Coast Salmon FMP, which includes Chinook salmon, identifies all of the San Francisco Bay as essential fish habitat.[117]

STATE REGULATIONS

California Endangered Species Act

Under the CESA, the CDFW has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code Section 2070). The CDFW also maintains a list of candidate species, which are species formally under review for addition to either the list of endangered species or the list of threatened species.

The CESA prohibits the take of plant and animal species that the California Fish and Game Commission has designated as either threatened or endangered in California. "Take" in the context of the CESA means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill a listed species (California Fish and Game Code Section 86). The take prohibitions also apply to candidates for listing under the CESA. However, Section 2081 of the CESA allows the CDFW to issue permits for the minor and incidental "take" of species by an individual or permitted activity listed under the CESA.

In accordance with the requirements of the CESA, an agency reviewing a project within its jurisdiction must determine if any State-listed endangered or threatened species could be present in the project area. The agency also must determine if the project could have a potentially significant impact on such species. In addition, the CDFW encourages informal consultation on any project that could affect a candidate species. Project impacts on species on the CESA endangered list or threatened list would be considered significant in this EIR. Impacts on Species

[117] U.S. Army Corps of Engineers (Corps), Programmatic Essential Fish Habitat (EFH) Assessment for the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region. July 2009.

of Special Concern would be considered significant under certain circumstances, as discussed below.

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (CNPPA) (California Fish and Game Code Sections 1900–1913), which directed the CDFW to carry out the legislature's intent to "preserve, protect, and enhance endangered plants in this State." The CNPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. The CESA expanded on the original CNPPA and enhanced legal protection for plants. The CESA established threatened and endangered species categories and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, three listing categories for plants are used in California: rare, threatened, and endangered.

Special-Status Natural Communities

The CDFW's Natural Heritage Division identifies special-status natural communities, which are those that are naturally rare and those whose extent has been greatly diminished through changes in land use. The CNDDB tracks 135 such natural communities in the same way that it tracks occurrences of special-status species: information is maintained on each site for the natural community's location, extent, habitat quality, level of disturbance, and current protection measures. The CDFW is mandated to seek the long-term perpetuation of the areas in which these communities occur. Although there is no Statewide law that requires protection of all special-status natural communities, CEQA requires consideration of the potential impacts of a project on biological resources of Statewide or regional significance.

California Fish and Game Code

Fully Protected Species

Certain species are considered fully protected, meaning that the California Fish and Game Code explicitly prohibits all take of individuals of these species except for take permitted for scientific research. Fully protected amphibians and reptiles, fish, birds, and mammals are listed in Sections 5050, 5515, 3511, and 4700, respectively.

It is possible for a species to be protected under the California Fish and Game Code, but not be fully protected. For instance, mountain lion (*Puma concolor*) is protected under Section 4800 et seq., but is not a fully protected species.

Protection of Birds and Their Nests

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. Migratory non-game birds are protected under Section 3800, whereas other specified birds are protected under Section 3505. Any loss of fertile eggs or nesting raptors, or any activities resulting in nest abandonment, would constitute a significant impact. Project impacts on birds of prey would not be considered "significant" in this EIR unless the species are known to, or have a high potential to, nest on the site or rely on it for primary foraging.

Marine Life Management Act

Within California, most of the legislative authority over fisheries management is enacted within the Marine Life Management Act. This law directs CDFW and the Fish and Game Commission to issue sport and commercial harvesting licenses, as well as license aquaculture operations. CDFW, through the commission, is the State's lead biological resource agency and is responsible for enforcement of the State endangered species regulations and the protection and management of all State biological resources.

Marine Invasive Species Act

All shipping operations that involve major marine vessels are subject to the Marine Invasive Species Act of 2003 (Public Resources Code Sections 71200–71271), which revised and expanded the California Ballast Water Management for Control of Non-indigenous Species Act of 1999 (Assembly Bill 703). This act is administered by the State Lands Commission. The act regulates the handling of ballast water from marine vessels arriving at California ports in order to prevent or minimize the introduction of invasive species from other regions.

State Regulation of Wetlands and Other Waters

The State's authority in regulating activities in wetlands and waters in the project area resides primarily with the State Water Resources Control Board (SWRCB). The SWRCB, acting through the San Francisco RWQCB, must certify that a Corps permit action meets State water quality objectives (CWA Section 401). Any condition of water quality certification is then incorporated into the Corps Section 404 permit authorized for the project.

The SWRCB and RWQCB also have jurisdiction over Waters of the State under the Porter-Cologne Water Quality Control Act (Porter-Cologne). The SWRCB and RWQCB evaluate proposed actions for consistency with the RWQCB's *Basin Plan*, and authorize impacts on

Waters of the State by issuing Waste Discharge Requirements (WDR) or, in some cases, a waiver of WDR.

The San Francisco BCDC has jurisdiction over coastal activities occurring within and around San Francisco Bay and Suisun Marsh. BCDC was created by the McAteer-Petris Act (California Government Code Sections 66600−66682). BCDC regulates fill, extraction of materials, and substantial change in use of land, water, and structures in San Francisco Bay and development within 100 feet of the Bay. BCDC has jurisdiction over all areas of San Francisco Bay that are subject to tidal action, including subtidal areas, intertidal areas, and tidal marsh areas that are between mean high tide and five feet above mean sea level. BCDC's permit jurisdiction does not extend to Federally owned areas, such as Golden Gate National Recreation Area lands, because they are excluded from State coastal zones pursuant to the Coastal Zone Management Act of 1972 (CZMA). However, the CZMA requires that all applicants for Federal permits obtain certification from the State's approved coastal program to ensure a proposed project is consistent with the State's coastal program. In San Francisco Bay, BCDC is charged with making this consistency determination.

California Rare Plant Rankings

CDFW works in collaboration with the CNPS and botanical experts to maintain an Inventory of Rare and Endangered Plants, and the similar Special Vascular Plants, Bryophytes, and Lichens List. The plant species on these lists may meet the CEQA definition of rare or endangered. As the trustee agency for the plants and wildlife of California, ecological communities, and the habitat upon which they depend, CDFW advises public agencies during the CEQA process to help ensure that the actions they approve do not significantly impact such resources. CDFW often advises that plant species with an appropriate California Rare Plant Rank in the Inventory be properly analyzed by the lead agency during project review to ensure compliance with CEQA. The following definitions are used in the California Rare Plant Ranking system:

- Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere.
- Rank 1B: Plants Rare, Threatened, or Endangered in California and elsewhere.
- Rank 2A: Plants presumed extirpated in California, but more common elsewhere.
- Rank 2B: Plants Rare, Threatened, or Endangered in California, but more common elsewhere.
- Rank 3: Plants about which more information is needed (A Review List).
- Rank 4: Plants of limited distribution (A Watch List).

LOCAL REGULATIONS AND PLANS

San Francisco General Plan

The Environmental Protection Element of the *San Francisco General Plan* contains the following objectives and policies related to biological resources protection that are relevant to the Proposed Project:

General

Objective 1 Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources.

- Policy 1.1 Conserve and protect the natural resources of San Francisco.
- Policy 1.2 Improve the quality of natural resources.
- Policy 1.3 Restore and replenish the supply of natural resources.
- Policy 1.4 Assure that all new development meets strict environmental quality standards and recognizes human needs.

Bay, Ocean, and Shorelines

Objective 3 Maintain and improve the quality of the bay, ocean, and shoreline areas.

- Policy 3.1 Cooperate with and otherwise support regulatory programs of existing regional, state, and federal agencies dealing with the Bay.
- Policy 3.2 Promote the use and development of shoreline areas consistent with the General Plan and the best interest of San Francisco.

Land

Objective 7 Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the City's citizens.

- Policy 7.3 Require that filling of land adheres to the highest standards of soils engineering consistent with the proposed use.

Flora and Fauna

Objective 8 Ensure the protection of plant and animal life in the City.

- Policy 8.1 Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.
- Policy 8.2 Protect the habitats of known plant and animal species that require a relatively natural environment.
- Policy 8.3 Protect rare and endangered species.

San Francisco Public Works Code

The San Francisco's Urban Forestry Ordinance (Article 16 of the Public Works Code) protects street trees, significant trees, and landmark trees under San Francisco Public Works (SFPW) jurisdiction, regardless of species. The ordinance protects the following three categories of trees:

- A **street tree** is "any tree growing within the public right-of-way, including unimproved public streets and sidewalks, and any tree growing on land under the jurisdiction of the Department [of Public Works]," as defined in Section 802 of the ordinance. Section 806b requires entities (other than the SFPW) to obtain a permit from the department before removing any street trees.
- A **significant tree** is defined in Section 810A of the ordinance as any tree (1) located on property under the jurisdiction of the SFPW or on privately owned property with any portion of its trunk within 10 feet of the public right-of-way; and (2) any tree that satisfies at least one of the following criteria: a diameter at breast height in excess of 12 inches, a height in excess of 20 feet, or a canopy in excess of 15 feet. Any entity other than the SFPW must obtain a permit to remove significant trees according to the process described in Section 806b.
- A **landmark tree** is any tree that (1) has been nominated as such by a member of the public, a landowner, the San Francisco Planning Commission, the Board of Supervisors, or the Historic Preservation Commission; (2) the Urban Forestry Council (within the San Francisco Department of the Environment) has subsequently recommended as a landmark tree; and (3) is designated a landmark tree by ordinance approved by the Board of Supervisors. According to Section 810 of the ordinance, nominated trees undergoing review are protected according to the same standards as designated landmark trees until the review process is completed.

Permits are required for planting or removing street trees and significant trees, and protection measures are required for these trees if construction work would occur within the trees' drip lines.[118] There are no significant or street trees that would meet these definitions and there are no landmark trees on or adjacent to the project site. No disturbance within the drip line of the eucalyptus trees on Irish Hill is planned under the Proposed Project, even though these trees are not protected under the City's urban forestry ordinance.

San Francisco Planning Code 139 (Standards for Bird-Safe Buildings)

The San Francisco Planning Department adopted *Standards for Bird-Safe Buildings* in 2011, adding Planning Code Section 139.[119] These standards guide the use and types of glass and façade treatments, wind generators and grates, and lighting treatments. The standards impose requirements for bird-safe glazing and lighting in structures or at sites that represent a hazard to

[118] The area defined by the outermost circumference of a tree canopy where water drips from and onto the ground.
[119] San Francisco Planning Department, *Standards for Bird-Safe Buildings*, 2011.

birds and provide information on educational and voluntary programs related to bird hazards. The standards define two types of bird hazards: location-related hazards and feature-related hazards.

Location-related hazards are buildings located inside of, or within a clear flight path of less than 300 feet from, an Urban Bird Refuge.[120] In such locations, bird-safe treatments are required for new buildings; for additions to existing buildings; or for existing buildings in which 50 percent or more of the glazing within the "bird collision zone" is to be replaced.[121] The standards require implementation of the following treatments for façades facing, or located within, an Urban Bird Refuge:

- No more than 10 percent untreated glazing is allowed on building façades within the bird collision zone.
- Lighting must be shielded, and no uplighting is permitted. No event searchlights are permitted.
- Sites are not permitted to use horizontal access windmills or vertical access wind generators that do not appear solid.

Feature-related hazards include building- or structure-related features that are considered potential "bird traps" regardless of location (e.g., glass courtyards, transparent building corners, or clear glass walls on rooftops or balconies). These features must be fully treated (100 percent) with bird-safe glazing.

San Francisco Bay Plan

The *San Francisco Bay Plan* specifies goals, objectives, and policies for existing and proposed waterfront land use and other areas under the jurisdiction of BCDC. Major policies of the *San Francisco Bay Plan* applicable to wildlife include, but are not limited to, the following:

4. Justifiable Filling. Some Bay filling may be justified for purposes of providing substantial public benefits if these same benefits could not be achieved equally well without filling. Substantial public benefits are provided by:
    a. Developing adequate port terminals, on a regional basis, to keep San Francisco Bay in the forefront of the world's great harbors during a period of rapid change in shipping technology.
    b. Developing adequate land for industries that require access to shipping channels for transportation of raw materials or manufactured products.

[120] An Urban Bird Refuge is defined in the *Standards for Bird-Safe Buildings* as any area of open space 2 acres or larger that is dominated by vegetation, including vegetated landscaping, forest, meadows, grassland, water features, or wetlands; open water; and some green rooftops.

[121] The "bird collision zone" is that portion of the building that begins at grade and extends upward for 60 feet.

c. Developing new recreational opportunities – shoreline parks, marinas, fishing piers, beaches, hiking and bicycling paths, and scenic drives.

d. Developing expanded airport terminals and runways if regional studies demonstrate that there are no feasible sites for major airport development away from the Bay.

e. Developing new freeway routes (with construction on pilings, not solid fill) if thorough study determines that no feasible alternatives are available.

f. Developing new public access to the Bay and enhancing shoreline appearance over and above that provided by other Bay Plan policies – through filling limited to Bay-related commercial recreation and public assembly.

5. Effects of Bay Filling. Bay filling should be limited to the purposes listed above [see no. 4] because any filling is harmful to the Bay, and thus to present and future generations of Bay Area residents. All Bay filling has one or more of the following harmful effects:

a. Filling destroys the habitat of fish and wildlife. Future filling can disrupt the ecological balance in the Bay, which has already been damaged by past fills, and can endanger the very existence of some species of birds and fish. The Bay, including open water, mudflats, and marshlands, is a complex biological system in which microorganisms, plants, fish, waterfowl, and shorebirds live in a delicate balance created by nature, and in which seemingly minor changes, such as a new fill or dredging project, may have far-reaching and sometimes highly destructive effects.

San Francisco Bay Subtidal Habitat Goals Project

In 2010, BCDC, the California Ocean Protection Council/California State Coastal Conservancy, NOAA, and the San Francisco Estuary Partnership, in collaboration with the broader scientific community, managers, restoration practitioners, and stakeholders, published a set of restoration planning goals and guidelines for the subtidal areas and habitats of San Francisco Bay.[122] Though currently neither a policy nor regulatory document, this report offers guidance on opportunities for subtidal restoration and protection. Implementation will occur through a number of avenues; for example, local governments may incorporate these recommendations into their planning processes and documents, and regulatory agencies may use this report to evaluate, revise, or implement their policies.

Subtidal habitat consists of all the submerged area beneath San Francisco Bay water surface and includes mud, shell, sand, rocks, artificial structures, shellfish beds, submerged aquatic vegetation, macroalgal beds, and the water column above the bay bottom. Submerged habitats are important for threatened species such as green sturgeon and Chinook salmon, commercial species like Dungeness crab and Pacific herring, and a host of other fish, shrimp, crabs, migratory waterfowl, and marine mammals.

[122] Shellfish Conservation and Restoration.

The San Francisco Bay Subtidal Habitat Goals Project takes a Bay-wide approach in setting science-based goals for maintaining a healthy, productive, and resilient ecosystem. Where possible, these subtidal goals are designed to connect with intertidal habitats and with goals developed by other projects, including goals for San Francisco Bay submerged and upland habitats. The goals and recommendations contained within the Subtidal Habitat Goals Project are not binding by regulation but are intended to serve as guidance to local, State, and Federal agencies when evaluating projects and their potential ecological effects, and when issuing permits.

The principal habitat conservation goals included in the Subtidal Habitat Goals Report that apply to Proposed Project include the following:

Soft Substrate:

- Promote no net increase to disturbance to San Francisco Bay soft bottom habitat.
- Promote no net loss to San Francisco Bay subtidal and intertidal sand habitats.

Rock Habitats:

- Promote no net loss of natural intertidal and subtidal rock habitats in San Francisco Bay.

Artificial Structures:

- Enhance and protect habitat function and the historical value of artificial structures in San Francisco Bay.
- Improve San Francisco Bay subtidal habitats by minimizing placement of artificial structures that are detrimental to subtidal habitat function.

Shellfish Beds:

- Protect San Francisco Bay native shellfish habitats (particularly native Olympia oyster) through no net loss to existing habitats.

Submerged Aquatic Vegetation:

- Protect existing eelgrass habitat in San Francisco Bay through no net loss to existing beds.

Macroalgal Beds:

- Protect San Francisco Bay *Fucus* beds through no net loss to existing beds.
- Protect San Francisco Bay *Gracilaria* beds through no net loss to existing beds.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would

result in a significant impact on biological resources. Implementation of the Proposed Project would have a significant effect on biological resources if the project would:

M.1 Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

M.2 Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

M.3 Have a substantial adverse effect on federally protected wetlands as defined by CWA Section 404 (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

M.4 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

M.5 Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

M.6 Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

APPROACH TO ANALYSIS

Impacts on biological resources are identified and evaluated based on relevant CEQA and local standards, policies, and guidelines; on the likelihood that special-status species, sensitive habitats, wetlands and waters, and wildlife corridors are present within the project area (as described in the Environmental Setting discussion on pp. 4.M.2-4.M.33); and on the likely effects that project construction, operation, and maintenance might have on these resources. Special-status resources that were determined to have a low or no potential to occur in the study area (individual plant and animal species as presented in Appendix E, Tables E-1 through E-3) are not considered in the impact analysis.

This section analyzes potential project impacts to biological resources during the construction phase (short-term) and the operations and maintenance phases (long-term) of the Proposed Project. The impact analysis does not discuss phasing of project construction activities because adverse effects associated with construction activities are assumed equally as each parcel is developed, and associated mitigation measures identified to avoid or reduce such effects would be implemented as parcels are developed, regardless of the development's phasing.

This analysis addresses potential direct, indirect, and cumulative impacts of the Proposed Project to special-status species, sensitive natural communities, waters of the U.S., and other biological resources. Direct impacts are impacts that would result from the Proposed Project and would

occur at the same time and place. Indirect impacts are impacts that would be caused by the Proposed Project, but could occur later in time or farther removed in distance while still reasonably foreseeable and related to the Proposed Project. Impact analyses typically characterize effects to biological resources as temporary or permanent, with a permanent impact referring to areas that are developed or otherwise precluded from restoration to a pre-project state.

For the purposes of this EIR, the word "substantial" as used in the significance thresholds above is defined by the following three principal components.

1. Magnitude and duration of the impact (e.g., substantial/not substantial)
2. Uniqueness of the affected resource (rarity)
3. Susceptibility of the affected resource to disturbance

The evaluation of significance must also consider the interrelationship of these three components. For example, a relatively small magnitude impact on a State or Federally listed species could be considered significant because the species is rare and believed to be very susceptible to disturbance. Conversely, a natural community such as California annual grassland is not necessarily rare or sensitive to disturbance, and thus a much larger magnitude of impact might be required to result in a significant impact. Impacts on biological resources are considered *significant* when project-related habitat modifications (e.g., development, introduction of non-native plant and animal species, increased human intrusion, barriers to movement, or landscape management) could reduce species populations to the extent that they become locally less numerous; impacts on habitats are considered *significant* when the habitats could not continue to support viable populations of associated plant and animal species as a result of project implementation. *Potentially significant* impacts are those that may not be sufficiently reduced through non-discretionary regulatory standards (see below); in those cases the lead agency would need to implement mitigation measures to reduce the potential level of an impact to less than significant.

This impact analysis is divided into two broad categories: Terrestrial and Marine. Generally speaking, environmental impacts on biological resources could result from implementation of any of the Proposed Project elements described in this EIR, including demolishing existing buildings and other structures, relocating streets, making shoreline improvements and adding access, making infrastructure improvements, and constructing new infrastructure, buildings, and proposed open spaces.

Those features of the Proposed Project that could have an effect on biological resources, either terrestrial or marine, as described below under "Project Features," are the same or substantially similar under the Maximum Residential Scenario and the Maximum Commercial Scenario, the three options for sewer/wastewater treatment, and the three options for grading around

Building 12 that are analyzed in this EIR. To the extent that these features may differ somewhat from one to another, they are generally included and accounted for in an analysis of maximum disturbance within the project site or adjacent waters. Where the three options for sewer/wastewater would differ, they are discussed. The same biological regulatory requirements and mitigation measures applicable to the Proposed Project are equally applicable under the Proposed Project's scenarios and options. Therefore, this analysis of impacts on biological resources applies to both scenarios and the options, and no separate analysis of impacts under each scenario or option is necessary.

PROJECT FEATURES

The following is a general summary of the Proposed Project elements pertinent to the biological resources impact analysis.

Terrestrial

Those elements of the Proposed Project that could have an effect, either directly or indirectly, on terrestrial biological resources of the project site include:

- Building and infrastructure demolition or relocation;
- Ground disturbance from demolition of buildings, roadways, and other project site infrastructure; and grading on portions of Irish Hill;
- New building construction and materials that would present collision hazards to birds and bats; and
- Repair or replacement of the steel sheet pile bulkhead in Reach II with either a new sheet pile wall or a soldier pile wall.

Marine

As discussed in Chapter 2, Project Description, most project activities would occur inland from the high tide mark of San Francisco Bay. As a consequence, the Proposed Project would have few anticipated effects on the marine resources of San Francisco Bay. The following elements could have an effect, either directly or indirectly, on the marine resources of San Francisco Bay:

- Construction of the shoreline improvements, including location of the extended Bay Trail, waterfront promenades, the construction and operation of planned viewing pavilions adjacent to Bay waters, construction of hardscape steps leading down to San Francisco Bay waters, and riprap revetment upgrading;
- Repair or replacement of the steel sheet pile bulkhead in Reach II with either a new sheet pile wall or a soldier pile wall;

- Improvements to existing stormwater and sanitary sewer systems and existing stormwater outfalls at the bases of 20th and 22nd streets and/or construction and operation of a new storm drain outfall at the base of 21st Street that would discharge into San Francisco Bay;
- Use of land located immediately adjacent to San Francisco Bay for construction of park improvements and for staging of demolition or construction equipment, materials, or wastes prior to the completion of shoreline improvements; and
- Debris cleanup, pile removal, and reconstruction of a waterfront area seaward of the high tide mark and the marine intertidal zones in Reach I.

IMPACT EVALUATION

Project Impacts

Special-Status and Migratory Birds

Impact BI-1: Construction and operation of the Proposed Project would have a substantial adverse effect either directly or through habitat modifications on migratory birds and/or on bird species identified as special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. ***(Less than Significant with Mitigation)***

Construction Impacts

Construction activities within both the 20th/Illinois Parcel and the 28-Acre Site, especially those that involve heavy machinery, may adversely affect nesting bird species within 0.25 mile of the project site during the nesting season (January 15–August 15). Caspian tern and western gull nesting is documented at Piers 60 and 64, north of the project site and within this radius. Dilapidated piers northeast of the project site could provide potential nesting sites for these species and for double-crested cormorant. Osprey has previously nested south of the project site at Pier 80, also within 0.25 mile of the Proposed Project, and could forage or nest within the terrestrial study area. Although not previously documented in the project vicinity, American peregrine falcon could nest in or on existing buildings on the project site. Project activities would not disrupt foraging activities of California least tern or California brown pelican, which may use open water habitat and shorelines of the project study area; these species do not nest locally. Common species, such as mourning dove, house finch, Anna's hummingbird, black phoebe, barn swallow, cliff swallow, red-tailed hawk, and red-shouldered hawk, also have the potential to nest on the ground, within ruderal vegetation, eucalyptus trees, or in existing buildings on the project site.

Project construction activities and an increased human presence at the project site are expected to generate noise and visual disturbance that could adversely affect bird breeding and nesting behaviors at the project site and nearby. Proposed Project construction activities that may cause

visual disturbance, alter the ambient noise environment, or introduce short-term loud noise events resulting in avoidance response (flushing) include, but are not limited to, making shoreline protection improvements; constructing new buildings; making improvements to existing structures; constructing transportation and circulation improvements; adding new and upgraded utilities and infrastructure; constructing geotechnical and shoreline improvements (that require soldier pile driving or impact pile driving); and making improvements to publicly owned open space. A variety of construction activities, equipment, and schedules would be associated with each of these general types of construction.

Both long- and short-term loud noises can affect bird foraging and roosting by temporarily disturbing these behaviors, and may deter bird use of an area (including nesting) if such noises persist over the long term. However, overall avian activity within the study area is not expected to substantially change with project implementation because habitat value for birds foraging and nesting within the project site and vicinity would not substantially change (e.g., in-water foraging and nesting in eucalyptus trees on Irish Hill). Noise disturbance generally falls into two main categories: impulse and continuous. Impulse disturbances often used in demolition activities include single actions like blasts, or multiple actions like jackhammers and pile drivers. Continuous noise includes typical construction work area activities and roadway noise. Bird disruption from visual or noise disturbance varies, but typically birds will avoid disturbance areas and move to more preferable environments. However, some species inhabit noisy areas and may indirectly benefit from reduced competition and predation.[123]

Birds currently residing in both the terrestrial and marine study areas are accustomed to varying levels of ambient noise emanating from existing human activities in the area. For example, pedestrians and vehicular traffic are constant throughout the day and various Port activities are ongoing in the project vicinity on a regular basis. The primary sources of noise in the project vicinity are BAE Systems ship repair facilities, various industrial activities (e.g., American Industrial Center operations), construction activities along Illinois Street, and traffic on local streets surrounding the project site (Illinois, 20th, and 22nd streets) and the I-280 freeway corridor, located 0.25 mile west of the project site. Typical noise levels for some construction activities anticipated during project implementation would exceed ambient levels in the project vicinity. Construction activities that would substantially alter the noise environment could disrupt birds attempting to nest, disrupt parental foraging activity, or displace mated pairs with territories in the project vicinity.

[123] Francis, Clinton D., Catherine P. Ortega, and Alexander Cruz, Noise Pollution Changes Avian Communities and Species Interactions. *Current Biology* 19:1415–1419. August 25, 2009.

The loss of an active nest attributable to project activities would be considered a significant impact under CEQA. Moreover, disruption of nesting migratory or native birds is not permitted under the MBTA or California Fish and Game Code. Thus, the loss of any active nest by, for example, removing a tree, shrub, or building containing an active nest or causing visual or noise disturbance which leads to nest abandonment must be avoided under Federal and California law. Mitigation Measure M-BI-1: Worker Environmental Awareness Program Training, shown below, requires all project personnel involved in demolition or ground-disturbing work to attend an environmental training session prior to beginning work to educate workers on sensitive resources within and surrounding the project site and the regulatory environment protecting them, general protection measures and protocols to be implemented during construction, and consequences for non-compliance with project-specific protection measures. This measure, in combination with compliance with the MBTA and California Fish and Game Code, would avoid or reduce potential impacts on migratory and special-status birds to a less-than-significant level.

Mitigation Measure M-BI-1: Worker Environmental Awareness Program Training

Project-specific Worker Environmental Awareness Program (WEAP) training shall be developed and implemented by a qualified biologist and attended by all project personnel performing demolition or ground-disturbing work prior to beginning demolition or ground-disturbing work on site. The WEAP training shall generally include, but not be limited to, education about the following:

a) Applicable State and Federal laws, environmental regulations, project permit conditions, and penalties for non-compliance.

b) Special-status plant and animal species with the potential to be encountered on or in the vicinity of the project site during construction.

c) Avoidance measures and a protocol for encountering special-status species including a communication chain.

d) Preconstruction surveys and biological monitoring requirements associated with each phase of work and at specific locations within the project site (e.g., shoreline work) as biological resources and protection measures will vary depending on where work is occurring within the site, time of year, and construction activity.

e) Known sensitive resource areas in the project vicinity that are to be avoided and/or protected as well as approved project work areas, access roads, and staging areas.

f) Best management practices (BMPs) (e.g., straw wattles or spill kits) and their location around the project site for erosion control and species exclusion, in addition to general housekeeping requirements.

Operational Impacts

The project site is located within the Pacific Flyway along the western shoreline of San Francisco Bay. The waters of San Francisco Bay provide valuable stopover habitat for migratory birds that forage and replenish energy stores during spring and fall migrations. Open space, even in highly

urbanized areas, attracts avifauna, and any habitat that could be used for foraging, roosting, or rest by birds on the wing (in flight), such as park lands, landscape vegetation, or even the San Francisco Bay, in proximity to proposed new buildings may increase the risk of bird collisions, particularly from large amounts of reflective or artificially lighted surfaces.

Many bird collisions are induced by artificial night lighting. The tendency of birds to move toward lights at night when migrating, and their reluctance to leave the sphere of light influences for hours or days once encountered, have been well documented.[124] It has been suggested that structures located at key points along migratory routes may present a greater hazard than those at other locations.[125] Other research suggests that fatal bird collisions increase as light emissions increase, that weather often plays an important part in increasing the risk of collisions,[126] and that nights with heavy cloud cover and/or precipitation present the conditions most likely to result in high numbers of collisions.[127] The type of light used may affect its influence on the birds; for example, studies have indicated that blinking lights or strobe lights affect birds significantly less than non-blinking lights.[128, 129] Collisions with lighted buildings and other structures are not the only danger that nighttime lighting has for migratory birds. Birds can become "trapped" by a light source and, disoriented, continue to fly around the source until they become exhausted and drop to the ground, where they may be killed by predators[130] or die from stress or exhaustion.[131] Light attraction in birds is positively related to light intensity, and studies have shown that reduction in lighting intensity and changing fixed lighting to a flashing or intermittent light system can dramatically reduce avian mortality at lighted structures.[132] At least one controlled experiment has shown avian mortality can be dramatically reduced through shielding upward radiance of

[124] Gauthreaux, S.A., and C.G. Belser, 2006, *Effects of Artificial Night Lighting on Migrating Birds* (hereinafter referred to as *Effects of Artificial Night Lighting). In*: Rich, C., and T. Longhorn, Ecological Consequences of Night Lighting, Island Press, Covelo, CA, pp. 67-93.

[125] Ogden, L.E., 2002, Summary Report on the Bird Friendly Building Program: Effect of Light Reduction on Collision of Migratory Birds, Special Report for the Fatal Light Awareness Program (hereinafter referred to as Summary Report on the Bird Friendly Building Program). Available at www.flap.org.

[126] Verheijen, F.J., 1981, Bird kills at lighted man-made structures: not on nights close to a full moon. American Birds 35(3):251-254.

[127] Ogden, L.E., Summary Report on the Bird Friendly Building Program.

[128] Gauthreaux, S.A., and C.G. Belser, *Effects of Artificial Night Lighting*.

[129] Evans, W.R., Y. Akashi, N.A. Altman, and A.M. Manville, 2007, Response of night-migrating songbirds in cloud to colored and flashing light. North American Birds 60(4):476–88.

[130] Ogden, L.E., *Collision Course: The Hazards of Lighted Structures and Windows to Migrating Birds*, Special Report for the World Wildlife Fund and the Fatal Light Awareness Program, www.flap.org. September 1996.

[131] Reed, J.R., J.L. Sincock, and J.P. Hailman, 1985, Light Attraction in Endangered Procellariiform Birds: Reduction by Shielding Upward Radiation (hereinafter referred to as Light Attraction in Endangered Procellariiform Birds). The Auk 102:377–38.

[132] Jones, J., and C.M. Francis, 2003, The effects of light characteristics on avian mortality at lighthouses. Journal of Avian Biology 34:328–333.

lighting fixtures. In an experiment with fledgling seabirds in Hawaii, shielding the upward radiation of lights resulted in a 40 percent reduction in attraction to lights as the fledglings made their way from their nesting colonies to the sea.[133] Furthermore, during the study the sides of large buildings and the grounds remained fully lit by the shielded lights, suggesting that birds are not attracted to lighted areas, but to point-sources of light, which may be related to the use of stars and the moon as navigational aids.[134] Although the project site is located within the Pacific Flyway and in close proximity to the San Francisco shoreline, specific migratory corridors in the vicinity of the project site are unknown. It can be assumed, however, that numerous birds pass overhead or in the project vicinity during spring and fall migrations.

Direct effects on migratory as well as resident birds moving through the project site could include bird death or injury from collisions with lighted structures, and bird exhaustion and death due to light attraction, as well as bird collisions with glass during the daytime. Indirect effects to migratory birds could include delayed arrival at breeding or wintering grounds, and reduced energy stores necessary for migration, winter survival, or subsequent reproduction.[135] Development of the Proposed Project could increase the amount of light and glare at the project site and vicinity, including from building façades, internal night lighting, sources visible through windows of building exteriors, new streetlights and pedestrian lights within and adjacent to the site, nighttime lighting of building exteriors, and headlights from project-generated traffic. Buildings and structures at the project site may present a heightened risk of avian collisions due to a number of factors, including location along a known migratory route, proximity to migratory stopover locations, proximity to open space (natural habitat and those created under the Proposed Project), and being located in a region which experiences frequent fog which can adversely affect avian navigational awareness.[136]

Due to the surrounding urban setting, the Proposed Project is not expected to appreciably increase the overall amount of lighting along the San Francisco waterfront as a whole, considering existing nighttime lighting conditions within the project site and adjacent development along the eastern shoreline from San Francisco Bay to AT&T Park; however, avian collisions with glass or reflective surfaces used in the proposed buildings could result in mortality, which would be a significant impact under CEQA.

[133] Reed, et al., Light Attraction in Endangered Procellariiform Birds.
[134] Reed, et al., Light Attraction in Endangered Procellariiform Birds.
[135] Gauthreaux, S.A., and C.G. Belser, *Effects of Artificial Night Lighting.*
[136] Brown, H., S. Caputo, E.J. McAdams, M. Fowle, G. Phillips, C. Dewitt, and Y. Gelb, 2007, Bird Safe Building Guidelines, New York City Audubon Society. Available online at www.nycaudubon.org/pdf/BirdSafeBuildingGuidelines.pdf.

The Proposed Project would comply with the City of San Francisco's adopted *Standards for Bird-Safe Buildings*[137] (Planning Code Section 139) and would incorporate specific design elements into the development to avoid or minimize avian collisions with buildings or other project features. The City's *Standards for Bird-Safe Buildings* reflect the most current and accepted measures to prevent bird strikes.

The *Standards for Bird-Safe Buildings* address location-related hazards and/or feature-related hazards for birds on the wing and describe glass and façade treatments, wind generators and grates, and lighting treatments for buildings that can reduce avian collisions. The standards state that all buildings within an Urban Bird Refuge[138] present location-related hazards for birds. The proposed 5-acre waterfront park and 2-acre open space around Irish Hill qualify as Urban Bird Refuges. Thus, new building façades or additions to existing structures located inside of, or within a clear flight path less than 300 feet of the shoreline or Irish Hill (sufficient areas of open space to attract avifauna) would require certain treatments within the "bird collision zone."[139] Some examples include creating a visual signal or a visual noise barrier that alerts birds to the presence of glass objects, such as ceramic dots, or frits[140] applied between layers of insulated glass to reduce transmission of light.

Feature-related hazards include building- or structure-related features that are considered potential "bird traps" (e.g., glass courtyards, transparent building corners, or clear glass walls on rooftops or balconies) regardless of location. If these elements are used in the proposed buildings or structures, they must be fully treated (100 percent) with bird-safe glazing.

Project compliance with the *Standards for Bird-Safe Buildings,* as administered by the San Francisco Planning Department, would avoid or minimize the adverse effects of avian collisions; therefore, no additional mitigation is necessary.

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[137] San Francisco Planning Department, *Standards for Bird-Safe Buildings*, 2011. Available online at http://www.sf-planning.org/ftp/files/publications_reports/bird_safe_bldgs/Standards%20for%20Bird%20Safe%20Buildings%20-%2011-30-11.pdf.

[138] An Urban Bird Refuge is defined in the *Standards for Bird-Safe Buildings* as: any area of open space 2 acres or larger that is dominated by vegetation, including vegetated landscaping, forest, meadows, grassland, water features, or wetlands; within 300 feet of open water; and some green rooftops.

[139] The "bird collision zone" is that portion of the building that begins at grade and extends upward for 60 feet. This zone also applies to glass façades directly adjacent to large landscaped roofs (2 acres or larger) and extending upward 60 feet from the level of the subject roof.

[140] Frits are lines, dots, or other patterns incorporated into the glass or applied on its surface to make it more visible.

Special-Status and Otherwise Protected Bats

Impact BI-2: Construction of the Proposed Project would have a substantial adverse effect either directly or through habitat modifications on bats identified as special-status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the United States Fish and Wildlife Service. ***(Less than Significant with Mitigation)***

Common bats (Mexican free-tailed bat) and special-status bats (Pallid bat and Yuma myotis) have the potential to roost in existing vacant or underutilized buildings, other human-made structures, and trees within or near the 20th/Illinois Parcel and 28-Acre Site of the Proposed Project. Bats and other non-game mammals are protected in California under the State Fish and Game Code (described above in Regulatory Framework on pp. 4.M.37-4.M.39). Maternity roosts are roosts occupied by pregnant females or females with non-flying young. Non-breeding roosts are day roosts without pregnant females or non-flying young. Destruction of an occupied, non-breeding bat roost, resulting in the death of bats; disturbance that causes the loss of a maternity colony of bats (resulting in the death of young); or destruction of hibernacula[141] are prohibited under the California Fish and Game Code and would be considered a significant impact (although hibernacula generally are not formed by bat species in the Bay Area due to sufficiently high temperatures year round). This may occur due to direct or indirect disturbances. Direct disturbance could include building removal (demolition), tree removal, or roost destruction by any other means. Indirect disturbance to bat species could result in behavioral alterations due to construction-associated noise or vibration, or increased human activity in the area.

The Proposed Project would involve building demolition, relocation, or rehabilitation and site grading prior to construction. Although the eucalyptus trees adjacent to Irish Hill would not be removed under the Proposed Project, the trees could be trimmed or disturbed during construction. Demolition of Buildings 11, 15, 16, 19, 25, 32, and 66, and rehabilitation of Buildings 2, 12, and 21 could result in direct mortality of or indirect disturbance to roosting special-status bats, if present. Additionally, any bats roosting in eucalyptus trees in the project site could be disturbed by periphery construction activity. Direct mortality of special-status bats would be a significant impact. Additionally, common bats may establish maternity roosts in these same locations. Implementation of Mitigation Measure M-BI-2: Avoidance and Minimization Measures for Bats, shown below, would reduce potential impacts on special-status bats and common bat maternity roosts to a less-than-significant level by requiring preconstruction surveys and implementing avoidance measures if potential roosting habitat or active roosts are located.

[141] Hibernaculum refers to the winter quarters of a hibernating animal.

Mitigation Measure M-BI-2: Avoidance and Minimization Measures for Bats

A qualified biologist (as defined by CDFW[142]) who is experienced with bat surveying techniques (including auditory sampling methods), behavior, roosting habitat, and identification of local bat species shall be consulted prior to demolition or building relocation activities to conduct a pre-construction habitat assessment of the project site (focusing on buildings to be demolished or relocated) to characterize potential bat habitat and identify potentially active roost sites. No further action is required should the pre-construction habitat assessment not identify bat habitat or signs of potentially active bat roosts within the project site (e.g., guano, urine staining, dead bats, etc.).

The following measures shall be implemented should potential roosting habitat or potentially active bat roosts be identified during the habitat assessment in buildings to be demolished or relocated under the Proposed Project or in trees adjacent to construction activities that could be trimmed or removed under the Proposed Project:

a) In areas identified as potential roosting habitat during the habitat assessment, initial building demolition, relocation, and any tree work (trimming or removal) shall occur when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15, to the extent feasible. These dates avoid the bat maternity roosting season and period of winter torpor.[143]

b) Depending on temporal guidance as defined below, the qualified biologist shall conduct pre-construction surveys of potential bat roost sites identified during the initial habitat assessment no more than 14 days prior to building demolition or relocation, or any tree trimming or removal.

c) If active bat roosts or evidence of roosting is identified during pre-construction surveys, the qualified biologist shall determine, if possible, the type of roost and species. A no-disturbance buffer shall be established around roost sites until the qualified biologist determines they are no longer active. The size of the no-disturbance buffer would be determined by the qualified biologist and would depend on the species present, roost type, existing screening around the roost site (such as dense vegetation or a building), as well as the type of construction activity that would occur around the roost site.

   If special-status bat species or maternity or hibernation roosts are detected during these surveys, appropriate species- and roost-specific avoidance and protection measures shall be developed by the qualified biologist in coordination with CDFW. Such measures may include postponing the removal of buildings or structures, establishing exclusionary work buffers while the roost is active (e.g., 100-foot no-disturbance buffer), or other compensatory mitigation.

[142] CDFW defines credentials of a "qualified biologist" within permits or authorizations issued for a project. Typical qualifications include a minimum of five years of academic training and professional experience in biological sciences and related resource management activities, and a minimum of two years of experience conducting surveys for each species that may be present within the project area.

[143] Torpor refers to a state of decreased physiological activity with reduced body temperature and metabolic rate.

d) The qualified biologist shall be present during building demolition, relocation, or tree work if potential bat roosting habitat or active bat roosts are present. Buildings and trees with active roosts shall be disturbed only under clear weather conditions when precipitation is not forecast for three days and when daytime temperatures are at least 50 degrees Fahrenheit.

e) The demolition or relocation of buildings containing or suspected to contain bat roosting habitat or active bat roosts shall be done under the supervision of the qualified biologist. When appropriate, buildings shall be partially dismantled to significantly change the roost conditions, causing bats to abandon and not return to the roost, likely in the evening and after bats have emerged from the roost to forage. Under no circumstances shall active maternity roosts be disturbed until the roost disbands at the completion of the maternity roosting season or otherwise becomes inactive, as determined by the qualified biologist.

f) Trimming or removal of existing trees with potential bat roosting habitat or active (non-maternity or hibernation) bat roost sites shall follow a two-step removal process (which shall occur during the time of year when bats are active, according to a) above, and depending on the type of roost and species present, according to c) above).

   i. On the first day and under supervision of the qualified biologist, tree branches and limbs not containing cavities or fissures in which bats could roost shall be cut using chainsaws.

   ii. On the following day and under the supervision of the qualified biologist, the remainder of the tree may be trimmed or removed, either using chainsaws or other equipment (e.g., excavator or backhoe).

   iii. All felled trees shall remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any bats to escape, or be inspected once felled by the qualified biologist to ensure no bats remain within the tree and/or branches.

Special-Status Marine Species

Impact BI-3: Construction of the Proposed Project would have a substantial adverse effect, either directly or through habitat modifications, on aquatic species identified as candidate, sensitive, or special-status species in local, regional, or Federal plans, policies, or regulations, or by California Department of Fish and Wildlife, United States Fish and Wildlife Service, or National Oceanic and Atmospheric Administration. ***(Less than Significant with Mitigation)***

San Francisco Bay waters adjacent to the Proposed Project are used by multiple special-status marine species known to be present in the project site, including longfin smelt, green sturgeon, Pacific herring, harbor seals, California sea lions, and native Olympia oysters. In addition to FESA-, CESA-, and MMPA-listed species, as well as species of special concern, San Francisco

Bay waters adjacent to the project site are used by 16 fish species managed by one of three Fisheries Management Plans under the Magnuson-Stevens Act.[144]

Accidental Discharge and Stormwater Run-Off Impacts

The potential accidental discharge of hydrocarbon-containing materials (fuel, lubricating oils, construction materials), construction debris, and packing materials from staged equipment, building materials, and demolition debris that might be located or staged close to or adjacent to San Francisco Bay waters could pose a short-term and temporary risk of exposing these taxa to toxic contaminants and non-edible forage. Normal BMPs implemented as part of City of San Francisco, BCDC, and State Water Quality Control Board permits, such as conducting vehicle maintenance and refueling at a location away from the water's edge, installing surface runoff containment, and storing all hydrocarbon materials within secondary spill containment enclosures, etc., are expected to make the impact of these potential sources of contamination and their impact on special-status marine species less than significant. Other BMPs include installing secondary containment under all temporary fuel storage; using drip pans; using secondary containment or drip sheeting under parked construction equipment; using drain covers to seal off on-site storm drains; and adhering to specific requirements issued by the RWQCB for stormwater discharges within the City and County of San Francisco and in accordance with the Statewide stormwater permit, which contains additional actions to prevent and/or reduce project site sediment and other contaminants from reaching San Francisco Bay waters and causing any effect on resident offshore biological resources.

Demolition activities at the project site could also result in extensive ground disturbance and increased surface run-off through existing and future stormwater drains to San Francisco Bay, resulting in increased sedimentation and organic and inorganic contaminant loading to San Francisco Bay waters with low-level exposure to protected species. Potential impacts on special-status fish and marine mammal species due to increased contaminant loading to San Francisco Bay waters from low-level contaminated sediments could be significant if uncontrolled.

Implementation of normal construction and demolition BMPs required as part of City of San Francisco, regional (BCDC), and State (State Water Quality Control Board) permits to prevent disturbed sediments from reaching storm drains, such as using sediment curtains and storm drain covers and regularly sweeping streets, would be expected to reduce these impacts to a less-than-significant level. In addition, specific requirements issued by the RWQCB for stormwater discharges within the City and County of San Francisco in accordance with the Statewide

[144] AMS, Fish Species Inhabiting the Central San Francisco Bay Region.

stormwater permit contain additional actions to prevent and/or reduce project site sediment from reaching Bay waters and causing any significant effect on resident offshore biological resources.

Sewer/Stormwater Options

As presented in detail in Chapter 2, Project Description, pp. 2.59-2.66, and in Section 4.O, Hydrology and Water Quality, pp. 4.O.45-4.O-46, the Proposed Project proposes to upgrade the sewer and stormwater collection and transport system according to one of three options: a combined sewer and stormwater system, a separated sewer and stormwater system, and a hybrid option where a combined sewer and stormwater system would be located only in the eastern portion of the project site, with the rest of the site having a separated sewer and stormwater system. All three options would include repaired or improved outfalls at 20th and 22nd streets; however, in a separated and hybrid system option, a potential new outfall at 21st Street would be constructed in San Francisco Bay. The repair and potential construction of these outfalls would be expected to result in short-term disturbance to existing subtidal[145] soft and hard substrate habitat and associated biological communities. Although the potential disturbance and/or loss of these habitats and associated marine communities could have an effect on special-status fish and marine mammal foraging, the overall effect would be minor and less than significant because of the very small area being disturbed and the temporary nature of the disturbance. Once installed and repaired, these stormwater outfalls and any temporarily disturbed subtidal habitat associated with them would be expected to recover naturally and quickly to pre-disturbance conditions.[146]

Additionally, planned upgrades to the project site stormwater and sanitary waste collection, transport, and treatment system would ultimately reduce the contaminant loading of organic, inorganic, and fecal bacteria into San Francisco Bay waters (see Section 4.O, Hydrology and Water Quality, pp. 4.O.54-4.O.64). Therefore, potential impacts to special-status species from the improved stormwater and sanitary wastewater system and discharges to San Francisco Bay would be less than significant.

[145] Subtidal means occurring below the surface of the water.

[146] Blake, N.J., L.J. Doyle, and J.J Culter, 1996, Impacts and Direct Effects of Sand Dredging for Beach Renourishment on the Benthic Organisms and Geology of the West Florida Shelf (hereinafter referred to as Impacts and Direct Effects of Sand Dredging for Beach Renourishment). U.S. Department of the Interior, Minerals Management Service, Office of International Activities and Marine Minerals, Herndon, VA, OCS Final Report MMS 95-0005, 109 pp.

Sheet Pile and Soldier Pile Impacts

Temporary Loss of Intertidal Habitat

Planned shoreline improvements at the project site (Chapter 2, Project Description, pp. 2.71-2.74) would primarily occur shoreward or upland of the high tide mark and their implementation is not anticipated to have any effect on marine resources with the exception of the reconstruction of the steel sheet pile bulkhead in Reach II and repair and improvement of shoreline protective riprap.[147] The repair of the bulkhead would entail the installation of either a new sheet pile bulkhead or a soldier pile wall seaward of the existing bulkhead. The construction activities associated with either option would be expected to result in the temporary loss of the sessile[148] marine invertebrate community currently present, loss of a small area of soft substrate intertidal habitat in Reach I and associated marine communities, and potential temporary disturbance to soft and hard substrate habitat and associated marine communities where personnel and equipment transit to work on the reconstructed bulkhead. Recovery of disturbed intertidal habitat to pre-disturbance conditions is expected to occur naturally within 6 to 18 months with no remediate actions required.[149] Consequently, these disturbances are expected to be less than significant, and no mitigation is required.

Temporary Underwater Noise

The installation of either the sheet pile or soldier wall bulkhead (using precast H-piles) for improving Reach II, could result in the generation of potential underwater noise from either vibratory or impact pile-driving hammers used to install the pilings. This underwater noise could have a damaging effect on special-status fish species and marine mammals. High-intensity noise can result in acute damage to soft tissues, such as gas bladders or eyes (barotraumas), and/or in harassment that causes altered swimming, sleeping, or foraging behavior or temporary abandonment of forage habitat.

When a pile-driving hammer strikes a pile or sheet piling, it creates a pulse of sound that propagates through the pile, radiating out through the water column, seafloor, and air. Sound pressure pulses as a function of time are referred to as a waveform. Peak waveform pressure underwater is typically expressed in decibels (dB) referenced to 1 microPascal (µPa). Sound levels are generally reported as peak levels (peak) and sound exposure levels (SEL). In addition to the pressure pulse of the waveform, the frequency of the sound, expressed in hertz (Hz), is also

[147] Moffatt & Nichol, Preliminary Shoreline Improvements Report.
[148] Sessile means permanently attached or established and not free to move about (e.g., *sessile* sponges, algae, barnacles, etc.).
[149] Blake et al., Impacts and Direct Effects of Sand Dredging for Beach Renourishment.

important to evaluating the potential for sound impacts. Low-frequency sounds are typically capable of traveling over greater distances with less reduction in the pressure waveform than high-frequency sounds.

Installing steel sheet piling by a pile driver during the reconstruction of the bulkhead in Reach II can be expected to generate in-water noise levels of up to 177 dB (peak), 163 dB (root mean square [RMS]) and 162 dB (SEL) if a vibratory hammer is used, and 205 dB (peak), 189 dB (RMS), and 179 dB (SEL) if an impact hammer is used.[150] Similarly, installation of H-piling, depending on the size required for the bulkhead reconstruction, can be expected to generate 165 to 205 dB peak, 150 to 189 dB RMS, and 162 to 179 dB SEL depending on the size of the H-pile and whether an impact or vibratory hammer is used, as presented in Table 4.M.1: Estimated Near-Source Underwater Noise Levels from Pile Driving, below. Ambient underwater noise for a major harbor like San Francisco is estimated at approximately 150 dB.[151]

Scientific investigations on the potential effect of noise on fish indicate that peak underwater sound levels below 206 dB or accumulated SEL sound levels below 183 to 187 dB do not appear to result in any acute physical damage or mortality to fish (barotraumas) depending on their size.[152,153] Smaller fish (less than 2 grams in size) experience acute effects at accumulated SEL sound levels over 183 dB and larger fish (more than 2 grams in size) at 187 dB. Noise levels that result in startle responses in steelhead trout and salmon have been documented to occur at sound levels as low as 140 dB at a frequency of 100 Hz and between 180 and 186 dB in Pacific herring.[154] Any disturbance to FESA-listed fish species that results in altered swimming, foraging, movement along a migration corridor, or any other altered normal behavior would be considered harassment and a significant impact.

[150] Caltrans, Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (hereinafter referred to as Technical Guidance for Assessment and Mitigation). Final Report, 2009. Prepared for California Department of Transportation by ICF Jones & Stokes and Illingworth and Rodkin, Inc. February 2009. Available online at http://www.dot.ca.gov/hq/env/bio/files/Guidance_Manual_2_09.pdf.

[151] Caltrans, Technical Guidance for Assessment and Mitigation.

[152] Dalen, J., and G.M. Knutsen, *Scaring Effects of Fish and Harmful Effects on Eggs, Larvae and Fry from Offshore Seismic Explorations*. ICA Associated Symposium on Underwater Acoustics, July 16-18, 1986, Halifax, Canada.

[153] CalTrans, Technical Guidance for Assessment and Mitigation.

[154] San Luis and Delta Mendota Water Authority and C.H. Hanson, *Georgina Slough Acoustic Barrier Applied Research Project: Results of 1994 Phase II Field Tests*. Interagency Ecological Program for the San Francisco Bay/Delta estuary. Technical Report 44. May 1996.

Table 4.M.1: Estimated Near-Source Underwater Noise Levels from Pile Driving

Pile Size/Type	Relative Water Depth	Distance from Piling Measurement Taken	Average Sound Pressure			Attenuation Device
			Peak (dB)	RMS	SEL (dB)	
Vibratory Hammer						
10-inch steel H pile	~7 feet (2 meters)	~30 feet (10 meters)	161	147	NA	None
10-inch steel H pile	~7 feet (2 meters)	~65 feet (20 meters)	152	137	NA	None
24-inch AZ steel sheet	~50 feet (15 meters)	~30 feet (10 meters)	177	163	162	None
Impact Hammer						
10-inch steel H pile	~7 feet (2 meters)	~30 feet (10 meters)	190	175	NA	None
10-inch steel H pile	~7 feet (2 meters)	~65 feet (20 meters)	170	160	NA	None
12-inch steel H pile	~7 feet (2 meters)	~100 feet (30 meters)	179	165	NA	None
12-inch steel H pile	~7 feet (2 meters)	~180 feet (55 meters)	178	164	NA	None
12-inch steel H pile	~7 feet (2 meters)	~280 feet (85 meters)	165	150	NA	None
12-inch steel H pile	~16 feet (5 meters)	~230 feet (70 meters)	168	156	NA	None
12-inch steel H pile	~16 feet (5 meters)	~300 feet (90 meters)	170	158	NA	None
15-inch steel H pile, thin battered	~7-10 feet (2–3 meters)	~30 feet (10 meters)	190	165	155	None
15-inch steel H pile, thick vertical	~7-10 feet (2–3 meters)	~30 feet (10 meters)	195	180	170	None
24-inch AZ steel sheet	~50 feet (15 meters)	~30 feet (10 meters)	205	189	179	None

Notes:
Db = decibels
RMS = root mean square
SEL = sound exposure level

Source: CalTrans 2009

Table 4.M.2: Potential Effects of Varying Noise Levels to Fish and Marine Mammals, provides information about some known acute and sub-lethal effects of noise on fish and marine mammals. Table 4.M.3: Summary of NOAA Established Permanent Threshold Shift and Temporary Threshold Shift Sound Levels from Underwater Noise Levels for Marine Mammals, p. 4.M.65, presents recently adopted underwater noise levels that may cause both acute and sub-lethal effects for different groupings of marine mammals, as determined by NOAA.[155]

During pile-driving activities associated with reconstruction of the bulkhead in Reach II, fish are not expected to be present within a zone of 6 to 8 feet of the sheet piling or H-piles, since the movement of the piling through the shallow water and initial contact with the San Francisco Bay seafloor would cause any fish that are present to quickly leave the immediate area. Therefore, any longfin smelt, green sturgeon, Pacific herring, or Magnuson-Stevens Act-managed fish species swimming near pile-driving activities associated with reconstruction of the bulkhead in Reach II are not expected to experience any acute effects or barotraumas from vibratory pile driving. However, longfin smelt, Pacific herring, and green sturgeon have been observed in shallow water regions of San Francisco Bay, so there is a greater probability that they would be present in the project area during pile driving associated with reconstruction of the bulkhead in Reach II. Although the potential for acute barotrauma to occur is limited, behavioral changes in fish movement or activity can be expected. The use of vibratory pile drivers rather than impact pile drivers, or the application of established industry BMPs to reduce underwater noise generation from either equipment type, would be expected to substantially reduce underwater pile-driving noise, so that the potential impact would be less than significant.

Table 4.M.4: Estimated Vibratory and Impact Hammer Pile Driving Sound Levels and Disturbance to Criteria Levels, p. 4.M.66, lists estimated distances from the point of contact between the pile driver and the sheet piling or H-piling associated with reconstruction of the bulkhead in Reach II that sound levels can be expected to travel underwater in excess of 183 and 187 dB (SEL) for both impact and vibratory hammers. As discussed above on p. 4.M.60-4.M.61 and shown in Table 4.M.4, installing either steel sheet piling or steel H-piling for the bulkhead refurbishment would be expected to result in underwater noise levels that exceed 183 or 187 dB (SEL) depending on the final design approach used, whether an impact or vibratory hammer is used, and what size and type of piling is used for the soldier wall. It is unknown what size H-pile

[155] National Marine Fisheries Service (NMFS) 2016. Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Department of Commerce, NOAA. NOAA Technical Memorandum NMFS-OPR-55, 178p.

Table 4.M.2: Potential Effects of Varying Noise Levels to Fish and Marine Mammals

Taxa	Sound Level (dB)	Effect	Reference
Fish			
All fish >2 grams in size	206 (peak) 187 (SEL)	Acute barotraumas[1]	Fisheries Hydroacoustic Working Group 2008
All fish <2 grams	186 (SEL)	Acute barotraumas	Fisheries Hydroacoustic Working Group 2008
Pacific herring	180–186 (peak)	Avoidance behavior	Dales and Knudsen 1986
Salmon, steelhead	166 (SEL)	Avoidance behavior	Loeffelman et al. 1991
Salmon, steelhead	140–160 (SEL)	Startle response	San Luis and Delta Mendota Water Authority and C.H. Hanson 1996
Marine Mammals			
Marine mammals	180 (RMS) for cetaceans 190 (RMS) for pinnipeds	Level A[2] harassment out to 65 feet from sound source	NOAA Fisheries 2011
Marine mammals	160 RMS from impact hammer	Level B[3] harassment out to 328 feet from sound source	NOAA Fisheries 2011
Marine mammals	120 RMS from vibratory hammer	Level B[3] harassment out to 1.2 miles	NOAA Fisheries 2011
Harbor seals	166–195 (peak)	Can be detected at distances up to 2.9 miles	Terhung et al. 2002
Harbor seals	>155 (peak)	Avoidance behavior	Terhung et al. 2002
Harbor seals	107 at 12 kHz (peak)	Discomfort zone out 66 feet from the sound source	Kastelein et al. 2008
Harbor seals	>75 (SEL)	Threshold level of detection	Kastak and Schusterman 1998

Notes:

dB = decibels

kHz = kilohertz

SEL = sound exposure level

[1] Barotrauma - High-intensity underwater noise that can result in acute damage to soft tissues, such as gas bladders, hearing membranes, or eyes of fish and other marine animals.

[2] Level A harassment is defined as any act of pursuit, torment, or annoyance with has the potential to injure a marine mammal or marine mammal stock in the wild.

[3] Level B harassment is defined as any act of pursuit, torment, or annoyance with has the potential to disturb a marine mammals or marine mammal stock in the wild.

Table 4.M.3: Summary of NOAA Established Permanent Threshold Shift[1] and Temporary Threshold Shift[2] Sound Levels[3] from Underwater Noise Levels for Marine Mammals

Hearing Group	Impulsive[4]	Non-impulsive[5]
Low-Frequency (LF) Cetaceans[6] (Baleen whales)	$L_{pk,\,flat}$: 219 dB $L_{E,}L_{F,24H:}$ 183 dB	$L_{E,}L_{F,24H:}$ 199 dB
Mid-Frequency (MF) Cetaceans (Dolphins, toothed whales, beaked whales, bottlenose dolphins)	$L_{pk,\,flat}$: 230 dB $L_{E,}L_{F,24H:}$ 185 dB	$L_{E,}L_{F,24H:}$ 198 dB
High-Frequency (HF) Cetaceans (True porpoises**,** Kogia, river dolphins, cephalohynchid, *Lageniorhynchus cruciger*, and *L. asustralis*)	$L_{pk,\,flat}$: 202 dB $L_{E,}L_{F,24H:}$ 155 dB	$L_{E,}L_{F,24H:}$ 173 dB
Phocid Pinnipeds[7] (True Seals) (Underwater)	$L_{pk,\,flat}$: 218 dB $L_{E,}L_{F,24H:}$ 185 dB	$L_{E,}L_{F,24H:}$ 201dB
Otariid Pinnipeds (Sea lions and fur seals) (Underwater)	$L_{pk,\,flat}$: 232 dB $L_{E,}L_{F,24H:}$ 203 dB	$L_{E,}L_{F,24H:}$ 219 dB

Notes:

dB = decibels

1 Permanent Threshold Shift is when a permanent reduction in hearing occurs or the frequencies at which sound can be detected is permanently reduced.

2 Temporary Threshold Shift is when a short-term (temporary) reduction in hearing or the frequency at which sound can be detected occurs.

3 Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of $1\mu Pa^2s$. In this table, thresholds are abbreviated to reflect American National Standards Institute (ANSI) standards. However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

4 Impulsive noise is a category of noise which includes unwanted, almost instantaneous sharp sounds.

5 All noise not included in the definition of impulsive noise.

6 Cetaceans - Marine mammals in the cetacean family that include whales, dolphins, and porpoises.

7 Pinnipeds – Marine mammal group that includes seals, sea lions, and walruses.

Sources: National Marine Fisheries Service 2016. Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Department of Commerce, NOAA, NOAA Technical Memorandum NMFS-OPR-55

Table 4.M.4: Estimated Vibratory and Impact Hammer Pile-Driving Sound Levels and Disturbance to Criteria Levels

Pile Type	Estimated Number of Strikes	Equipment Type	Distance to Sound Level Threshold[1] (feet)				Attenuation Equipment
			206 dB (Peak)	187 dB (SEL) (Fish ≥2g)	183 dB (SEL) (Fish <2g)	150 dB (SEL) (Behavioral)	
24-inch AZ steel sheet	100–200	Vibratory	0	16-23	29.5-46	243	None
10-inch steel H pile	580	Vibratory	0	0	0	9.8–20	None
24-inch AZ steel sheet	100–200	Impact	30	207–328	384-607	13,061	None
10-inch steel H pile	580	Impact	3	0	0	305–1,522	None
12-inch steel H pile	580	Impact	0–3	0	0	279–1,549	None
15-inch steel H pile, thin battered	580	Impact	3	5	9	328	None
15-inch steel H pile, thick vertical	580	Impact	7	51	95	3,280	None

Notes:

dB = decibels

g = gram

SEL = sound exposure level

1 Estimated number of strikes and distance to sound level thresholds area are calculated according to protocols outlined in Caltrans 2009.

would be used to build the soldier wall option or whether it might be built in-place or pile driven by either an impact or vibratory hammer.[156] As illustrated in the table, driving steel sheet piling with a vibratory hammer can generate noise levels of 183 dB (SEL) at a distance of 46 feet and 187 dB at a distance of 23 feet. If a vibratory hammer is used to drive the steel H-piles, the noise generated is expected to be minimal and only behavioral effects to fish and marine mammals might occur. If an impact hammer is used for H-piling 15 inches or larger, then noise levels of 183 dB and 187 dB (SEL) can be expected to travel 312 feet and 167 feet, respectively. If the sheet piling or H-piling installation occurs when the tide is in, the potential exists to generate underwater noise levels that could result in significant impacts to special-status fish species,

[156] Moffatt & Nichol, Preliminary Shoreline Improvements Report.

including Magnusson-Stevens Act-managed fish species, longfin smelt, green sturgeon, and Pacific herring. In addition, San Francisco Bay waters adjacent to the 28-Acre Site are regularly used by multiple marine mammal species, including harbor seals and California sea lions.

Consequently, underwater noise generated by vibratory or impact hammer installation of steel sheet or H-piling during the repair of the Reach II bulkhead has the potential to significantly impact special-status fish species, including Magnusson-Stevens Act-managed fish species, longfin smelt, Pacific herring, and green sturgeon, and multiple marine mammal species, including harbor seals and California sea lions. Implementation of Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals, shown below, would reduce the potential impact to a less-than-significant level.

Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals

Prior to the start of reconstruction of the bulkhead in Reach II, the project sponsors shall prepare a detailed Construction Plan that outlines the details of the piling installation approach. This Plan shall be reviewed and approved by the City of San Francisco or other designated City, State, or Federal agency, as determined by the San Francisco Planning Department. The information provided in this plan shall include, but not be limited to, the following:

- The type of piling to be used (whether sheet pile or H-pile);
- The piling size to be used;
- The method of pile installation to be used;
- Noise levels for the type of piling to be used and the method of pile driving;
- Recalculation of potential underwater noise levels that could be generated during pile driving using methodologies outlined in CalTrans 2009;[157] and
- When pile driving is to occur.

If the results of the recalculations provided in the detailed Construction Plan for pile driving discussed above indicate that underwater noise levels are less than183 dB (SEL) for fish at a distance of 33 feet (less than or equal to 10 meters) and 160 dB (RMS) sound pressure level or 120 dB (RMS) re 1 μPa impulse noise level for marine mammals for a distance 1,640 feet (500 meters), then no further measures are required to mitigate underwater noise. If recalculated noise levels are greater than those identified above, then the project sponsors shall develop a sound attenuation reduction and monitoring plan. This plan shall be reviewed and approved by the Planning Department Environmental Review Officer or other City-designated person. This plan shall provide detail on the sound attenuation system, detail methods used to monitor and verify sound levels during pile-driving activities, and all BMPs to be taken to reduce impact hammer pile-driving sound in the marine environment to an intensity level of less than 183 and

[157] Caltrans, Technical Guidance for Assessment and Mitigation.

160/120 dB (as identified above) at distances of 33 feet (less than or equal to 10 meters) for fish and 1,640 feet (500 meters) for marine mammals. The sound-monitoring results shall be made available to NOAA Fisheries. If, in the case of marine mammals, recalculated noise levels are greater than 160 dB (peak) at less than or equal to 1,640 feet (500 meters), then the project sponsors shall consult with NOAA to determine the need to obtain an Incidental Harassment Authorization (IHA) under the MMPA. If an IHA is required by NOAA, an application for an IHA shall be prepared by the project sponsor.

The plan shall incorporate as appropriate, but not be limited to, the following BMPs:

- Any impact-hammer-installed soldier wall H-pilings or sheet piling shall be conducted in strict accordance with the Long-Term Management Strategy (LTMS) work windows for Pacific herring,[158] during which the presence of Pacific herring in the project site is expected to be minimal unless, where applicable, NOAA Fisheries in their Section 7 consultation with the Corps determines that the potential effect to special-status fish species is less than significant.
- If pile installation using impact hammers must occur at times other than the approved LTMS work window for Pacific herring or result in underwater sound levels greater than those identified above, the project sponsors shall consult with both NOAA Fisheries and CDFW on the need to obtain incidental take authorizations to address potential impacts to longfin smelt and green sturgeon associated with reconstruction of the steel sheet pile bulkhead in Reach II, and to implement all requested actions to avoid impacts.
- A 1,640-foot (500-meter) safety zone shall be established and maintained around the sound source to the extent such a safety zone is located within in-water areas, for the protection of marine mammals in the event that sound levels are unknown or cannot be adequately predicted.
- In-water work activities associated with reconstruction of the steel sheet pile bulkhead in Reach II shall be halted when a marine mammal enters the 1,640-foot (500-meter) safety zone and shall cease until the mammal has been gone from the area for a minimum of 15 minutes.
- A “soft start” technique shall be used in all pile driving, giving marine mammals an opportunity to vacate the area.
- A NOAA Fisheries-approved biological monitor shall conduct daily surveys before and during impact hammer pile driving to inspect the safety zone and adjacent San Francisco Bay waters for marine mammals. The monitor shall be present as specified by NOAA Fisheries during the impact pile-driving phases of construction.
- Other BMPs shall be implemented as necessary, such as using bubble curtains or an air barrier, to reduce underwater noise levels to acceptable levels.

Alternatively, the project sponsors may consult with NOAA directly and submit evidence to the satisfaction of the Environmental Review Officer of NOAA consultation. In such

[158] U.S. Army Corps of Engineers, Programmatic Essential Fish Habitat (EFH) Assessment for the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region. July 2009.

case, the project sponsors shall comply with NOAA recommendations and/or requirements.

Jurisdictional Waters

Impact BI-4: The Proposed Project would have a substantial adverse effect on Federally protected waters as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means. ***(Less than Significant with Mitigation)***

San Francisco Bay is considered a navigable water of the United States and is therefore considered jurisdictional waters of the U.S. regulated by the Corps under Section 404 of the CWA up to the high tide line, and under Section 10 of the Rivers and Harbors Act up to the mean high water mark. These waters also are regulated by the RWQCB as Waters of the State and by BCDC, which has jurisdiction over all areas of San Francisco Bay that are subject to tidal action, as well as a 100-foot shoreline band.

Project activities such as demolition, extensive ground disturbance, grading, and shoreline improvements could result in increased surface run-off through stormwater drains to San Francisco Bay, or erosion or siltation into San Francisco Bay. In the case of soil erosion or an accidental release of damaging materials during construction, the Proposed Project could indirectly impact water quality, a significant impact. However, as described in Section 4.O, Hydrology and Water Quality, pp. 4.O.27-4.O.28, because the project site exceeds 1 acre in size, the project sponsors or future developers would be required to apply for coverage under the Construction General Stormwater Permit to comply with Federal National Pollutant Discharge Elimination System (NPDES) regulations (NPDES permit), and would be required to develop and implement a Stormwater Pollution Prevention Plan (SWPPP) that identifies appropriate construction BMPs designed to prevent pollutants from coming into contact with stormwater and to keep all products of erosion and stormwater pollutants from moving offsite into receiving waters. As described on pp. 4.O.46-4.O.54, implementation of the SWPPP would maintain the potential for degradation of water quality in wetlands and other jurisdictional waters at a less-than-significant level.

The Proposed Project includes shoreline improvements to the 28-Acre Site that would repair or replace existing shoreline protection and the existing bulkhead along Reach II with a new sheet piling or soldier wall adjacent to the east (seaward) of the existing concrete bulkhead. Additionally, planned upgrades to the project site's stormwater and sanitary waste collection, transport, and treatment system could include rebuilding the outfalls at 20th and 22nd streets or the installation of a new outfall at 21st Street under the separated system approach or the hybrid system approach (see Chapter 2, Project Description, pp. 2.59-2.66, and Section 4.O, Hydrology and Water Quality, pp. 4.O.46-4.O.47), and possible cleanup and rehabilitation of the intertidal

areas in Reaches I and IV. Should this option be selected, these activities would result in both temporary impacts to jurisdictional waters during repair of the existing shoreline protection, bulkhead, or 20th and 22nd streets outfalls, or installation of the new 21st Street outfall, as well as potential permanent impacts through placement of fill material associated with a new bulkhead and/or a new 21st Street stormwater outfall, which would be considered a significant impact. Installation of a new 21st Street outfall would result in permanent fill of jurisdictional waters. Permanent impacts resulting from placement of San Francisco Bay fill associated with the repair of the existing, or construction of a new, bulkhead, would occur only if the repaired or new bulkhead exceeded the current extent (footprint and/or volume) of existing structures within jurisdictional waters. Minor deviations in the structure's configuration or filled area—including those due to changes in materials, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards—that are necessary to make the repair, rehabilitation, or replacement is considered fill, but typically would be authorized as a non-substantial change to the marine environment. No other project work is planned to occur below the high tide line that would affect jurisdictional waters.

Project activities resulting in the discharge of Bay fill[159] or other disturbance to jurisdictional waters (i.e., below the high tide line) require permit approval from the Corps, and a water quality certification and/or waste discharge requirements from the RWQCB. Those projects within San Francisco Bay or within the shoreline band require a permit from BCDC. Collectively, these regulatory agencies and the permits and authorizations they issue for the Proposed Project would require that placement of new fill in jurisdictional waters be avoided or minimized to the maximum extent practicable while still accomplishing the Proposed Project's purpose, and would specify an array of measures and performance standards as conditions of Proposed Project approval. These permits would require water quality protection measures to avoid and/or minimize temporary impacts from in-water and above-water construction activities that would be implemented in conjunction with water quality protection mitigation measures identified in Section 4.O, Hydrology and Water Quality, pp. 4.O.60-4.O.61. These permits would also require protection measures for special-status marine species to ensure the necessary in-water work is not likely to cause adverse effects to Federally protected waters. Measures would include working within work "windows" for fish and marine mammals as specified by NMFS (June 15–November

[159] Under CWA Section 404, a permit is required for the 'discharge of dredged or fill material' into waters of the United States. Fill material is any substance placed (also described as discharged) in waters of the United States where the material has the effect of either replacing any portion of a water of the United States with dry land or changing the bottom elevation of any portion of a water. Examples of fill material include rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mining or other excavation activities, and materials used to create any structure or infrastructure (such as outfall pipes and/or bulkheads under the Proposed Project) in waters of the United States. [USACE SPN-2003-01 and 33 CFR 323.2(5) (e)(1)]

30), implementing noise minimization strategies for in-water work (e.g., pile driving as discussed under Impact BI-4, pp. 4.M.69-4.M.71), and monitoring behavioral response to in-water work.

In addition, permanent placement of new fill resulting in the loss of jurisdictional waters in excess of that necessary for normal maintenance may trigger a requirement for compensatory mitigation that will be aimed at restoring or enhancing similar ecological functions and services as those displaced. The types, amounts, and methods of compensatory measures required will differ between the permitting agencies depending on the specific resources they regulate and the policies and guidelines they implement.

Implementation of Mitigation Measure M-BI-4: Compensation for Fill of Jurisdictional Waters, shown below, would reduce potential Proposed Project-related impacts on jurisdictional waters to a less-than-significant level by requiring restoration or enhancement of the San Francisco shoreline or intertidal/subtidal habitat along the eastern waterfront as compensation for the permanent fill of jurisdictional waters in support of the Proposed Project if it is determined, through review by regulatory agencies, that the placement of permanent fill in San Francisco Bay exceeds the minimum threshold for repair and replacement or new, permanent fill is placed.

Mitigation Measure M-BI-4: Compensation for Fill of Jurisdictional Waters

To offset temporary and/or permanent impacts to jurisdictional waters of San Francisco Bay adjacent to the 28-Acre Site, construction associated with repair or replacement of the Reach II bulkhead shall be conducted as required by regulatory permits (i.e., those issued by the Corps, RWQCB, and BCDC) and in coordination with NMFS as appropriate. If required by regulatory permits, compensatory mitigation shall be provided as necessary, at a minimum ratio of 1:1 for fill beyond that required for normal repair and maintenance of existing structures. Compensation may include on-site or off-site shoreline improvements or intertidal/subtidal habitat enhancements along San Francisco's eastern waterfront through removal of chemically treated wood material (e.g., pilings, decking, etc.) by pulling, cutting, or breaking off piles at least 1 foot below mudline or removal of other unengineered debris (e.g., concrete-filled drums or large pieces of concrete).

Improvements would be implemented in accordance with NMFS as appropriate. On-site or off-site restoration/enhancement plans, if required, must be prepared by a qualified biologist prior to construction and approved by the permitting agencies prior to beginning construction, repair, or replacement of the Reach II bulkhead. Implementation of restoration/enhancement activities by the permittee shall occur prior to project impacts, whenever possible.

Wildlife Movement

Impact BI-5: The Proposed Project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. ***(Less than Significant with Mitigation)***

Terrestrial

As discussed under Impact BI-2, pp. 4.M.55-4.M.57, construction of the Proposed Project could affect birds attempting to nest within the project site directly through nest destruction or avian mortality, and indirectly through an increase in the ambient noise environment that might disrupt breeding behavior, discourage nesting, or cause nest abandonment. Through City-required bird-safe building design standards, operation of the Proposed Project would not adversely affect resident or migratory birds through an increased risk of collision with new buildings or structures presenting location-related or feature-related hazards. Compliance with the MBTA and California Fish and Game Code, and compliance with the San Francisco Planning Code Section 139 (*Standards for Bird-Safe Buildings*) are expected to reduce potential construction-related effects on birds nesting within the project site and surrounding vicinity and potential collision hazards for migrating birds to less-than-significant levels.

Marine

As discussed in Impact BI-3, pp. 4.M.57-4.M.69, underwater noise levels from impact hammers that could be used to install steel sheet piling or steel H-piling for the renovation of the bulkhead in Reach II could be high enough to result in avoidance behavior by marine mammals as they move throughout San Francisco Bay to forage or to reach pupping sites. As illustrated in Table 4.M.4, p. 4.M.66, underwater noise levels greater than 150 dB, the documented noise level at which marine mammals exhibit altered behavioral actions, can occur at distances between 279 and 3,281 feet from an impact hammer.

Harbor seals have permanent colonies at Castro Rocks in San Pablo Bay, Yerba Buena Island in the Central Bay basin, and Mowry Slough in the South Bay.[160] The year-round harbor seal "haul-out" on Yerba Buena Island's southwestern corner is located approximately 3.6 miles north of the project site. As a result, adult and juvenile harbor seals can be expected to be present in San Francisco Bay waters adjacent to the project site. Additionally, harbor seals and California sea lions forage throughout San Francisco Bay, feeding on schooling fish such as smelt, anchovies, herring, rockfish, sculpin, perch, and midshipmen, along with squid and mysid shrimp, many of

[160] NOAA, National Marine Fisheries Service, Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007. Santa Rosa, California.

which are present in the waters adjacent to the project site. Consequently, if impact hammers are used for pile driving, harbor seals and California sea lions could be subjected to underwater noise levels high enough to cause avoidance behavior while they migrate to or from haul-out or pupping locations or during normal foraging.

Recent studies conducted by NMFS[161] and CDFW[162] indicate that the primary migration corridor for salmon and steelhead in San Francisco Bay is through Raccoon Straight and north of Yerba Buena Island (the northern reaches of the Central Bay basin). This is in part because any spawning habitat in the Central Bay basin and South Bay basin streams and watersheds is inaccessible to salmon and steelhead. Additionally, a recent study evaluating 30 years of IEP monthly mid-water fish trawl data and 3 years of acoustic tag data of hatchery-raised salmonids suggests that the presence of out-migrating juvenile salmonids (steelhead and salmon) along the Port of San Francisco waterfront appears to be more the result of capture by tidal flow rather than active foraging or intentional swimming to those areas of San Francisco Bay.[163] This study also indicates that there is a very low probability of any salmonids being present in the shallow waters adjacent to the project site where potential underwater noise levels would be high enough to result in any behavioral disturbance. As a consequence, any potential disturbance to migrating salmonids (steelhead and salmon) would be very minimal in the waters adjacent to the project site.

The potential impact from impact-hammer-generated noise on special-status marine mammal species, including harbor seals and California sea lions, migrating to or from haul-out and pupping sites or foraging could be significant. Implementation of Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals, pp. 4.M.67-4.M.69, would reduce this potential impact to a less-than-significant level.

[161] National Marine Fisheries Service (NMFS), Biological Opinion for the San Francisco-Oakland Bay Bridge East Span Seismic Safety Project, 2001.

[162] Baxter, R., K. Hieb, S. DeLeon, K. Fleming, and J. Orsi, *Report on the 1980-1995 Fish, Shrimp, and Crab Sampling in the San Francisco Estuary, California*, 1999. Prepared for The Interagency Ecological Program for the Sacramento-San Joaquin Estuary. California Department of Fish and Game, Stockton, California.

[163] Jahn, A., Young Salmonid Out-Migration Through San Francisco By with Special Focus on Their Presence at the San Francisco Waterfront. Draft Report, January 2011. Prepared for the Port of San Francisco.

Plans and Policies

Impact BI-6: The Proposed Project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and would not have a substantial conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan. *(Less than Significant)*

No adopted habitat conservation plan or natural community conservation plan covers the project site, and therefore the Proposed Project could not conflict with these plans. There are no protected street trees, significant trees, or landmark trees on the project site. Therefore, the Proposed Project would have no impact.

Marine

The San Francisco Bay Subtidal Habitat Goals Report, as discussed in "Local Regulations and Plans," pp. 4.M.44-4.M.45, provides a scientific foundation and approach for the conservation and enhancement of submerged areas of San Francisco Bay and was prepared in collaboration with BCDC, California Ocean Protection Council/California State Coastal Conservancy, NOAA, and the San Francisco Estuary Partnership.[164] As such, it contains many recommended conservation goals for San Francisco Bay subtidal habitats that potentially could be affected by the Proposed Project, including the installation of the new sheet piling or soldier wall adjacent to the concrete bulkhead in Reach II. Conservation goals also include removal of old creosote wood pilings, wood, concrete, brick debris, and assorted trash and discarded materials currently present along the 28-Acre Site's shoreline. Replacing the existing debris (concrete and brick) in Reaches I and IV with quarry rock would be consistent with the resource management goals of the San Francisco Bay Subtidal Habitats Goals Report; however, these measures currently are not proposed by the project sponsors as part of the Proposed Project.

These goals can be used by multiple agencies when evaluating proposed projects within their jurisdiction. The Subtidal Habitat Goals Report includes habitat conservation goals that promote no net loss or disturbance to soft bottom and rock habitats (subtidal and intertidal zones), enhancing habitat function of artificial structures, minimizing placement of artificial structures detrimental to subtidal habitat function, protecting native shellfish habitat and existing eelgrass habitat, and protecting macroalgal beds (*Fucus* and *Gracilaria* spp.). Although the San Francisco Bay Subtidal Habitat Goals Project has no regulatory authority, any detrimental changes to Bay–

[164] San Francisco Bay Subtidal Habitat Goals Project, San Francisco Bay Subtidal Habitat Goals Report – Conservation Planning for the Submerged Areas of the Bay; 50-Year Conservation Plan, 2010. Available online at http://www.sfbaysubtidal.org/report.html.

Delta subtidal habitats could also have potential negative effects to special-status species, managed fish species, essential fish habitat (EFH), or important forage for marine mammals.

At present, with the exception of the proposed repair of the bulkhead in Reach II and the repair and construction of a new stormwater outfall, no major project work is planned to occur below the high tide mark. The reconstruction of the Reach II bulkhead can be expected to have a very minor and short-term effect on any of the subtidal or intertidal habits and conservation goals outlined in the San Francisco Bay Subtidal Habitats Goals Report. The temporary loss of artificial hard bottom sessile habitat currently existing on the vertical surface of the bulkhead would be replaced with new artificial habitat of similar size and area. Any disturbance or loss of intertidal sand or hard bottom habitat (intertidal rocks) and associated biological communities from construction personnel and equipment during reconstruction of the bulkhead would be temporary and minimal in comparison to the extent of undisturbed intertidal habitat fronting the project site.

Finally, no additional actions or mitigation measures to prevent the introduction or spread of harmful invasive species are required for either of these project activities since no invasive species were observed inhabiting the intertidal areas of the project waterfront that are not already well-established members of the intertidal and subtidal biological communities of San Francisco Bay.[165]

Cumulative Impacts

Geographic Extent/Context

The geographic scope of potential cumulative impacts on biological resources encompasses the species occurrences, habitats, and sensitive natural communities within the project study area, as well as biologically linked areas sharing the eastern waterfront of San Francisco and San Francisco Bay. The cumulative analysis uses a list-based approach to analyze the effects of Proposed Project construction and operation in combination with other past, present, and reasonably foreseeable future projects in the immediate vicinity.

The cumulative impact analysis assumes that construction and operation of other projects in the geographical area would have to comply with the same regulatory requirements as the Proposed Project, which would serve to avoid or reduce many impacts to less-than-significant levels on a project-by-project basis. The analysis then considers whether or not there would be a significant, adverse cumulative impact associated with implementation of the Proposed Project in combination with past, present, and probable future projects in the geographical area, and if so,

[165] AMS, Intertidal Habitat and Biological Community Survey.

whether or not the Proposed Project's incremental contribution to the cumulative impact would be considerable. Both conditions must apply in order for a project's cumulative effects to rise to the level of significance.

Past, Present, and Reasonably Foreseeable Projects

The following current and reasonably foreseeable projects may result in impacts to biological resources and are included in the analysis of the Proposed Project's cumulative impacts. Section 4.A, Introduction to Chapter 4, pp. 4.A.12-4.A.18, provides a summary description of each project and its status and schedule. Figure 4.A.1: Location of Foreseeable Future Projects, p. 4.A.7, depicts their locations.

Waterfront Projects:

- Golden State Warriors Event Center and Mixed Use Development
- Future Crane Cove Park
- Seawall Lot 337 / Pier 48 Mission Rock Development
- Mariposa Pump Station Interim Repairs
- San Francisco Port BAE Lease Renewal
- Mission Bay Ferry Landing

Landside Redevelopment near the Pier 70 Project Site:

- 2177 Third Street
- 2051 Third Street / 650 Illinois Street
- Demolition of Building 117 (Orton Historic Core Sub Area)[166]

Past cumulative projects, including the development of civic facilities, residences, commercial and industrial areas, and infrastructure, have already caused substantial adverse cumulative changes to biological resources in the San Francisco peninsula. For example, portions of the project study area were converted from their original tidal wetland habitat beginning over a century ago for industrial uses, with near complete loss of the original habitat types and any of the species that once occurred.

Unpaved, open areas have matured over time and provide a "new normal" in terms of habitat, often simplified in terms of diversity, and supporting a different suite of species than once existed. Overall, this is true of many areas throughout the region. The effects of these past

[166] San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

projects are reflected in the baseline conditions described in Environmental Setting, pp. 4.M.2-4.M.33.

With the exception of Seawall Lot 337 / Pier 48 Mission Rock Development, Mission Bay Ferry Landing, and demolition of Building 117, all of the projects listed above have undergone environmental review and environmental impacts have been avoided or minimized to the extent feasible. Some of these projects are expected to have mostly temporary impacts on biological resources during the construction phase of the project. Other projects, such as the future Crane Cove Park, which would provide an open space area, would include elements likely to result in beneficial effects on biological resources. Such elements include improved foraging opportunity and nesting or roosting habitat for terrestrial wildlife, and improved shoreline diversity and subtidal and intertidal habitat associated with removal of non-engineered debris at the boat ramp and pier replacement/refurbishing. Seawall Lot 337 / Pier 48 Mission Rock Development is currently undergoing environmental review and is expected to result in potential adverse effects on terrestrial and marine biological resources similar to those with the Proposed Project, but not to a degree that would alter the cumulative significance of implementing the proposed projects. Similarly, the proposed demolition of Building 117 is undergoing environmental review, as required by CEQA, but is not expected to result in significant adverse effects on either terrestrial or marine biological resources. Funding has been secured for the Mission Bay Ferry Landing project, which would also undergo environmental review and is not expected to result in significant adverse effects on either terrestrial or marine biological resources.

Impact C-BI-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would result in a cumulatively considerable contribution to significant biological resources impacts. ***(Less than Significant with Mitigation)***

Terrestrial

The Proposed Project would have a limited effect on terrestrial biological resources that inhabit the project site and surrounding vicinity primarily because the existing built-out environment of the study area offers marginal habitat value to resident species. Short-term construction impacts identified in "Impact Evaluation," pp. 4.M.49-4.M.55, include potential disturbance to nesting birds and roosting bats. Long-term operational impacts include a potential increased risk of bird collisions with project buildings or features. Project compliance with the City's Bird Safe Building Standards would reduce the Proposed Project's long-term impact on birds resulting from collisions, and implementation of identified mitigation measures would reduce the Proposed Project's impact on nesting birds and roosting bats during construction; together these ensure the Proposed Project's incremental effect on such resources would not be cumulatively considerable. Mitigation Measure M-BI-1: Worker Environmental Awareness Program Training, p. 4.M.51,

would educate project personnel about the biological resources on the project site, the laws and regulations protecting them and penalties for non-compliance, and avoidance or protection measures to be employed during construction to minimize project-related impacts to these resources. Potential impacts to nesting birds or roosting bats within the trees or buildings of the project site associated with development would be minimized through project compliance with MBTA and California Fish and Game Code, and implementation of Mitigation Measure M-BI-2, pp. 4.M.56-4.M.57, where active nests or roosts would be identified during preconstruction survey efforts and protective buffers established until they are no longer in use. Similar foraging and roosting opportunities for these species would be available on-site after completion of the Proposed Project, so the long-term incremental effects of the Proposed Project would not be cumulatively considerable.

Development of the projects on San Francisco's eastern waterfront listed above on p. 4.M.76 is likely to have limited effects on nesting birds and roosting bats, similar to those with the Proposed Project; however, given the limited extent of existing habitat and poor habitat quality in these planned development areas, project implementation would not result in a cumulatively considerable impact on terrestrial resources. Mitigation measures similar to those for the Proposed Project would reduce the incremental effect of the individual projects on such resources. Project compliance with the City's *Standards for Bird-Safe Buildings* for buildings within 300 feet of the San Francisco Bay shoreline or adjacent to parks or open space would reduce the location-related hazards to resident and migratory birds posed by waterfront development projects, and treatments applied to reflective or transparent building elements would reduce bird collisions with project features.

Landside redevelopment projects in the vicinity of the Proposed Project may result in similar temporary impacts to biological resources considered under the project analysis; however, given their existing conditions and location away from the eastern waterfront, these project sites likely offer even less habitat for terrestrial resources than the Proposed Project site.

None of the potential adverse effects identified for the Proposed Project would result in a cumulative effect with other approved or anticipated projects considered in this analysis.

Marine

The Proposed Project would have limited activities and potential effects on marine habitats and associated biological communities within the Central Bay basin waters and marine habitats adjacent to the project site, primarily because limited project components would occur below the high tide mark. Potential effects on marine habitat and biological taxa identified in "Impact Evaluation," pp. 4.M.57-4.M.73, include potential temporary loss of intertidal habitat, noise from pile-driving activities to repair an existing bulkhead in Reach II, and the potential for accidental

discharges from stored construction and demolition equipment, supplies, and materials near San Francisco Bay waters.

The potential effects of these activities on the marine taxa and communities present at or adjacent to the project site, including special-status species such as longfin smelt, Pacific herring, green sturgeon, and native oysters, would be expected to be temporary, with the exception of the reconstruction of the Reach II bulkhead, the 20th and 22nd streets combined sewer discharge outfalls, and 21st Street stormwater outfall. These activities are not expected to result in the cumulative permanent loss of habitat or species associated with those habitats, such as the native oyster. Potentially, the clean-up and refurbishment of the shoreline could result in an overall improvement of the subtidal and intertidal habitat and the associated reestablished community.

Additionally, the implementation of established BMPs and mitigation measures (Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals, and Mitigation Measure M-BI-4: Compensation for Fill of Jurisdictional Waters) identified in the EIR are anticipated to reduce all of these potential impacts to a less-than-significant level.

All of these potential impacts are common to any project sited on the San Francisco Bay shoreline. Despite this commonality with other similar projects, none of these Proposed Project impacts are anticipated to result in a cumulatively considerable contribution to a significant cumulative impact with other approved or reasonably foreseeable projects.

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N. GEOLOGY AND SOILS

Section 4.N, Geology and Soils, addresses the geologic and soils impacts that could result from construction and operation of the proposed Pier 70 Mixed-Use District Project. The section begins with a description of existing geologic and soils conditions, including paleontological resources, in the region and on the project site, and then presents an evaluation of seismic impacts related to fault rupture, seismically induced ground shaking, seismically induced ground failure (e.g., liquefaction and lateral spread), and seismically induced landslides; soil erosion and loss of topsoil; creation of unstable soil or geologic units; problematic soils; alteration of topography and effects on unique geologic and physical features; and unique paleontological resources. Erosion issues are also discussed in Section 4.O, Hydrology and Water Quality, on pp. 4.O.46-4.O.54.

The discussions of site-specific geologic and seismic conditions at the project site are based on a preliminary geotechnical investigation of the 28-Acre Site in 2012[1] and a preliminary geotechnical evaluation of the Illinois Parcels in 2015.[2] Both studies included a review of available geotechnical and seismic information to evaluate geologic and seismic conditions at the project site. The 2012 investigation also included the installation of soil borings and excavation of test pits to supplement this information.[3] However, as noted in the impact discussions below (Impacts and Mitigation Measures, pp. 4.N.20-4.N.35), site-specific geotechnical investigations would be required for individual development projects under the Proposed Project in accordance with the San Francisco and Port of San Francisco Building Codes to identify the project-specific construction and design measures that would be incorporated into the final building design to alleviate geotechnical and seismic hazards.

ENVIRONMENTAL SETTING

REGIONAL SETTING

San Francisco is located in the northern portion of the San Francisco Peninsula, which is part of the geologically complex California Coast Ranges geomorphic province.[4] The Coast Ranges province is characterized by a series of northwest-trending ridges and valleys that run roughly parallel to the San Andreas Fault Zone, and can be further divided into the northern and southern

[1] Treadwell & Rollo, *Preliminary Geotechnical Investigation, Pier 70, San Francisco, California*, December 19, 2012 (hereinafter referred to as "*Pier 70 Preliminary Geotechnical Investigation*").

[2] Treadwell & Rollo, *Preliminary Geotechnical Evaluation, Pier 70-Illinois/20th Street and Hoe Down Yard, San Francisco, California*, February 23, 2015 (hereinafter referred to as "*Illinois Parcels Preliminary Geotechnical Evaluation*").

[3] When discussed together, the preliminary geotechnical investigation and preliminary geotechnical evaluation are referred to as the "geotechnical evaluations."

[4] Robert M. Norris and Robert W. Webb, *Geology of California*, second edition, 1990, p. 6.

ranges that are separated by San Francisco Bay. San Francisco Bay lies within a broad depression created from an east–west expansion between the San Andreas and the Hayward fault systems. The tectonic forces that dominate the region developed from the margin between the Pacific Plate and the North American Plate where the Pacific Plate slowly creeps northward past the North American Plate on the San Andreas, Hayward, and associated subsidiary faults. The Bay and the northern portion of the San Francisco Peninsula are within a structural down-dropped block between the Northern Santa Cruz Mountains to the west and Diablo Mountain Range to the east. Much of the Coast Range province is composed of marine sedimentary deposits and volcanic rocks. The relatively thick marine sediments dip east beneath the alluvium of the Great Valley province to the east.

The northwesterly trend of ridges and valleys characteristic of the Coast Ranges is obscured in San Francisco, except for features such as Russian Hill, Telegraph Hill, Hunters Point, and Potrero Hill. These relatively rugged hills are formed by Jurassic- to Cretaceous-aged[5] bedrock of the Franciscan Complex which underlies San Francisco. Fluctuating sea levels during the Quaternary period (the last 2 million years) resulted in alternating sequences of terrestrial[6] and estuarine[7] sediments over the eroded bedrock surface in San Francisco. Over the history of San Francisco's development, artificial fill has been placed over portions of the Bay in an effort to reclaim land.

PROJECT SITE TOPOGRAPHY AND GEOLOGY

The Proposed Project is located along the eastern shoreline of San Francisco at Potrero Point. Historical shoreline maps and photographs reviewed for a geotechnical evaluation of the project area indicate that the Irish Hill vicinity was formerly occupied by serpentinite bluffs overlooking tidal mud flats extending into San Francisco Bay.[8] The historic 1869 shoreline crossed the project site south of 20th Street and north of the Hoedown Yard (within the Illinois Parcels and roughly bisected the 28-Acre Site), as shown on Figure 4.N.1: Project Site Vicinity Geologic Map. Extensive blasting and quarrying of Potrero Point and Irish Hill during the late 1800s and early 1900s nearly leveled Irish Hill and generated substantial amounts of rock, which were placed in the tidal areas to extend and develop the shoreline toward the east, including most of the 28-Acre Site and the northeast portion of the Illinois Parcels.

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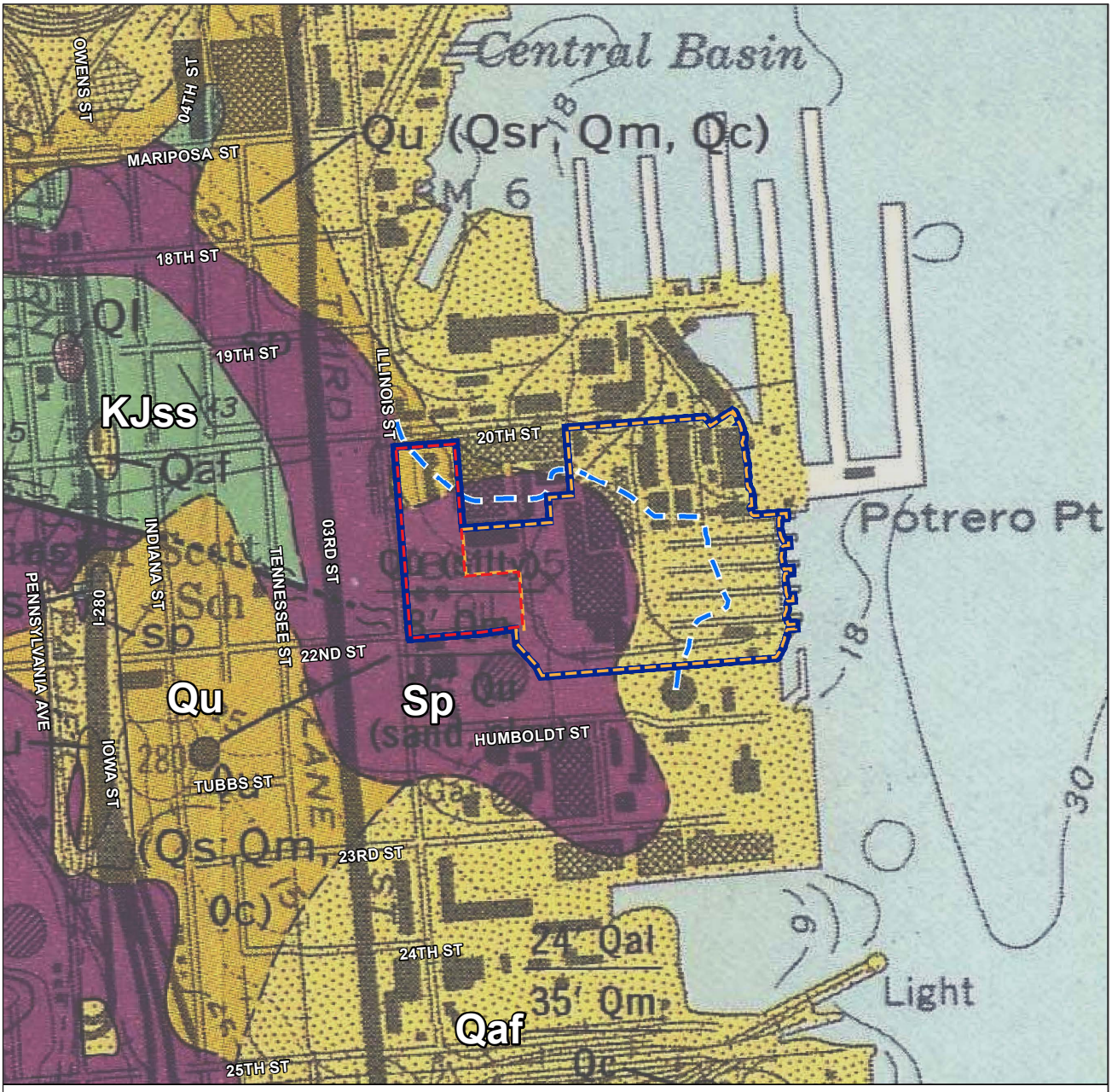
[5] The Jurassic and Cretaceous periods spanned the period from approximately 160 to 70 million years ago.

[6] Terrestrial sediments consist of mixtures of gravel, sand, silt, and clay deposited by rivers and streams. Such sediments are generally referred to as alluvial deposits.

[7] Estuarine sediments generally consist of silts and clays deposited in inland marine areas affected by fresh water. These sediments are often rich in organic matter and sometimes contain sand. San Francisco Bay and its adjacent tidal marshlands are estuarine environments.

[8] Treadwell & Rollo, *Illinois Parcels Preliminary Geotechnical Evaluation*, pp. 8 and 9.



Source: Geologic Map of the San Francisco North Quadrangle, San Francisco and Marin Counties, California, Schlocker 1974.

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.N.1: PROJECT SITE VICINITY GEOLOGIC MAP

The southern portion of the Illinois Parcels includes the remnant of Irish Hill, which reaches a height of approximately 78 feet North American Vertical Datum 88 (NAVD88) or 167 feet project datum.[9] A steep bedrock cut separates the southern portion of the Hoedown Yard from the adjacent 28-Acre Site to the east and also extends north from the remnant of Irish Hill, transecting the 20th/Illinois Parcel. Elevations in the relatively level southern portion of the existing Hoedown Yard range from about 37 to 41 feet NAVD88 (126 to 130 feet project datum), and elevations in the relatively level area to the east of the bedrock cuts are over 20 feet lower, ranging from about 11 to 15 feet NAVD88 (100 to 104 feet project datum). This area slopes gently towards the Bay.

The 20th/Illinois Parcel includes a crescent-shape cut that is mostly retained by concrete retaining walls. In other areas, near vertical cuts expose bedrock materials. The bedrock exposed in the cuts separating the Hoedown Yard from the 28-Acre Site is covered with a gunite[10] veneer, which is cracking and separating from the rock in many locations.

The preliminary geotechnical evaluations for both the 28-Acre Site and the Illinois Parcels indicate that serpentinite bedrock of the Franciscan Complex, including the remnant of Irish Hill, is exposed throughout most of the southwestern portion of the project site, as shown on Figure 4.N.1.[11,12] The remainder of the site is immediately underlain by artificial fill. The Franciscan Complex is late Jurassic and early Cretaceous age (164 to 100 million years ago). The serpentinite component of the Franciscan Complex is mostly sheared and highly fractured rock containing hard inclusions of less fractured serpentinite, sandstone, shale, and chert. The depth to bedrock rapidly increases towards the Bay, plunging to the northeast and southeast of Irish Hill; the depth to bedrock reaches about 70 feet in the northeast portion of the 28-Acre Site. As discussed in "Naturally Occurring Asbestos" in Section 4.P, Hazards and Hazardous Materials, pp. 4.P.9, the serpentinite of the Franciscan Complex commonly contains naturally occurring asbestos.

North and east of the historic shoreline, the project site is underlain by variable thicknesses of artificial fill, marsh deposits, and weak compressible marine clay known as Young Bay Mud. These deposits are described as follows:

- **Artificial Fill** – generally consists of locally quarried rock, sand, and clay with wood, slag, concrete, and brick debris that was placed on the surface of near-shore Bay Mud and

[9] San Francisco City Datum (SFCD) is 11.32 feet above North American Vertical Datum 1988, plus or minus about two hundredths of a foot at different locations in the City. The project datum is equal to SFCD plus 100 feet.
[10] Gunite is a concrete mixture that is sometimes applied to rock surfaces to make them more stable.
[11] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, pp. 8 and 9.
[12] Treadwell & Rollo, *Illinois Parcels Preliminary Geotechnical Evaluation*, pp. 3-4.

marsh deposits in an unengineered condition. The fill extends to depths of 37 feet below ground surface (bgs).

- **Marsh Deposits** – generally consist of sandy clay with gravel.
- **Young Bay Mud** – generally consists of weak, compressible marine clay. The thickness increases to the east, and reaches up to 40 feet thick at the Bay shoreline.

PALEONTOLOGICAL RESOURCES

Paleontological resources are the fossilized remains or impressions of prehistoric plants and animals used to document the existence of extinct life forms and to reconstruct the environments in which they lived. Fossils, including planktonic marine organisms, mollusks, and plant microfossils (pollen and spores), are typically found in river, lake, and bog deposits, although they may occur in nearly any type of sedimentary sequence. Sedimentary rocks of the Franciscan Complex have produced significant fossils important for understanding the age, depositional environments, and tectonic history of the San Francisco area.[13] For example, fossil material was uncovered in an excavation for a new building in the northeast quadrant of San Francisco. As noted above on p. 4.N.4, preliminary geotechnical evaluations for both the 28-Acre Site and the Illinois Parcels indicate that serpentinite bedrock of the Franciscan Complex, including sandstone, shale, and chert, is exposed throughout most of the western portion of the project site. Although plant and invertebrate fossil remains have been found in Young Bay Mud, which occurs at variable depths throughout the project site, these fossils are abundant and their occurrence would not be noteworthy. Further, no vertebrate fossils have been identified in the Young Bay Mud in San Francisco.[14] Therefore, the Young Bay Mud is considered to have a low paleontological sensitivity.[15] The remainder of the project site is underlain by artificial fill and recent marsh deposits that would have a low probability of containing paleontological resources.

SLIPWAYS AND CRANEWAYS

Concrete ship slipways (Slipways 5 through 8) and craneways were constructed along the Bay shoreline at the eastern border of the project site in the early 1940s for ship construction and maintenance. These structures are supported on 8- to 10-inch-diameter timber piles and concrete walls. Five timber piles observed during excavation of a test pit for the 2012 geotechnical

[13] Elder, William, Mesozoic Molluscan Fossils from the Golden Gate National Recreation Area and their Significance to Franciscan Complex Terrane Reconstructions, San Francisco Bay Area, California, December 2015. Available online at https://www.nature.nps.gov/geology/paleontology/pub/grd3_3/goga1.htm. Accessed December 2, 2015.

[14] University of California Museum of Paleontology, UCMP Specimen Search. Available online at http://ucmpdb.berkeley.edu/. Accessed June 15, 2016.

[15] Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This sensitivity is determined by rock type, past history of the rock unit in producing significant fossils, and fossil localities that are recorded from that unit.

investigation at Pier 70 were embedded in a concrete pile cap 2.0 feet deep and 2.5 feet wide.[16] One pile exposed in the test pit was observed to be in deteriorated condition. Load testing of one of the piles demonstrated that the piles may not be capable of supporting building loads. It is assumed that the other piles that were not exposed during the geotechnical investigation are also in a deteriorated condition.

The slipways slope towards the Bay shore, and unsupported 17-foot-wide unreinforced concrete slabs separate the slipways from the craneways on either side. The area above the slipways and unsupported concrete slabs was filled to the existing site grade between 1969 and 1972, and is protected at the Bay margin by the sheet pile bulkhead of the craneways. The bulkhead extends from an elevation of about 30 feet NAVD88 (59 feet project datum) at the bottom to an elevation of 0 to 11 feet NAVD88 (89 to 100 feet project datum) at the top.[17]

GROUNDWATER

During the geotechnical evaluations of the 28-Acre Site (completed in 2012) and the Illinois Parcels (completed in 2015), the depth to groundwater was about 6 to 29 feet, although these groundwater levels could be tidally influenced in the areas closest to the Bay.[18,19] In areas of shallow bedrock, groundwater is likely perched atop the bedrock. Within the bedrock, groundwater could be encountered at any depth because it is typical for groundwater to seep through seams and fractures of the rock, which are unpredictable in sheared rock such as serpentinite.

GEOLOGIC HAZARDS

Settlement

Young Bay Mud (which underlies much of the project site beyond the historic 1869 shoreline) is saturated, soft, and compressible. When loads such as buildings are placed on it, the soft mud can compress and settle. Placement of the loads could also result in plastic deformation and lateral movement, sometimes accompanied by upthrusting in adjacent areas (creating so-called "mud waves"). Young Bay Mud has low shear strength (i.e., low resistance to downslope movement due to gravity of rock and differential pressures). For these reasons, Young Bay Mud is not considered suitable material for bearing foundations of anything but very light structures and usually is not relied upon to support vertical loads.

[16] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, p. 10.
[17] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, pp. 10 and 11.
[18] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, p. 10.
[19] Treadwell & Rollo, *Illinois Parcels Preliminary Geotechnical Evaluation*, p. 4.

Slope Failure

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, triggered either by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rock falls, rockslides, or rock avalanches, whereas soil slopes experience soil slumps, rapid debris flows, or deep-seated rotational slides. Slope stability can depend on a number of complex variables, including the geology, structure, and amount of groundwater, as well as external processes such as climate, topography, slope geometry, and human activity. Slope movements are affected by factors that decrease the resistance in the slope materials and those that increase the stresses on the slope. Landslides can occur on slopes of 15 percent or less, but the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges.

The best available predictor of where slides and earth flows might occur is the distribution of past movements.[20] In 1997, the U.S. Geological Survey (USGS) released a preliminary map and geographic information system (GIS) database that provide a summary of the distribution of landslides evident in the landscape of the San Francisco Bay region.[21] The map is a digitized nine-county compilation of existing landslides that has been used to divide the region into four landslide zones: mostly landslides, many landslides, few landslides, and flatland.

The project site is primarily located within an area identified as "flatland," defined by the USGS as areas of gentle slope at low elevation that have little or no potential for the formation of slumps, translational slides, or earthflows except along stream banks and terrace margins. The southwest corner of the site, near the remnant of Irish Hill, is mapped as "few landslides," defined by the USGS as areas that contain few, if any, large mapped landslides, but locally contain scattered small landslides and questionably identified larger landslides. The geotechnical evaluation of the Illinois Parcels notes that the exposed bedrock in the near-vertical cuts at the project site is highly sheared and would be susceptible to rock fall. Boulders and other pieces of rock fragments were observed at the foot of several cuts.[22] Therefore, these cuts could be subject to sloughing and rock fall.

[20] T. H. Nilsen and B. L. Turner, *Influence of Rainfall and Ancient Landslide Deposits on Recent Landslides (1950-71) in Urban Areas of Contra Costa County, California*, U.S. Geological Survey Bulletin 1388, 1975, p. 1.
[21] U.S. Geological Survey, *Summary Distribution of Slides and Earth Flows in the San Francisco County, California*, Open File Report 97-745 Part C, by C. M. Wentworth, S. E. Graham, R. J. Pike, G. S. Beukelman, D. W. Ramsey, and A. D. Barron, 1997.
[22] Treadwell & Rollo, *Illinois Parcels Preliminary Geotechnical Evaluation*, p. 10.

Soil Hazards

In urbanized areas like the project site, native soils usually have been removed or reworked and combined with imported fill materials as a result of earthwork activities. Soils mapped on the project site include Urban Land beneath the Illinois Parcels and portions of the 28-Acre Site, and Urban Land-Orthents – reclaimed complex (0 to 2 percent slopes) beneath the remainder of the 28-Acre Site.[23] The Urban Land classification corresponds to soils formed in tidal flats and the Urban Land-Orthents reclaimed complex classification corresponds to artificial fill materials.

Expansive Soils

Problematic soils, such as expansive soils, can damage structures and buried utilities and increase maintenance requirements. Expansive soils are characterized by their ability to undergo significant volume change (i.e., to shrink and swell) due to variations in moisture content. Changes in soil moisture can result from rainfall, landscape irrigation, utility leakage, roof drainage, and/or perched groundwater.[24] Expansive soils are typically very fine grained and have a high to very high percentage of clay. Expansion and contraction of expansive soils in response to changes in moisture content can lead to differential and cyclical movements that can cause damage and/or distress to structures and equipment.

The artificial fill beneath the project site is sandy and gravelly[25] and would not be expansive. The Young Bay Mud is below the water table and is permanently saturated; therefore, it would not be subject to moisture changes that would cause expansion and contraction of the clay materials.

Corrosive Soils

Corrosive soils can damage buried metal structures (such as pipelines) and concrete (such as foundations) that is in direct contact with soil or bedrock. Typically, the most corrosive soils are those with the lowest pH and highest concentration of chlorides and sulfates. Wet/dry conditions can result in a concentration of chlorides and sulfates as well as movement in the soil that tends to break down protective corrosion films and coatings on the surface of building materials. High-sulfate soils are also corrosive to concrete and may prevent complete curing, thereby considerably reducing the strength of the concrete. Low pH and/or low-resistivity soils can corrode buried or partially buried metal structures. Depending on the degree of corrosivity of the subsurface soils,

[23] U.S. Department of Agriculture, Natural Resources Conservation Service, *Custom Soil Resource Report for San Mateo County, Eastern Part, and San Francisco County, California, Pier 70 SUD*, March 26, 2015.
[24] Perched groundwater is a local saturated zone above the water table that typically exists above an impervious layer (such as clay) of limited extent.
[25] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, p. 9

building materials such as concrete, reinforcing steel in concrete structures, and bare-metal structures exposed to these soils can deteriorate, eventually leading to structural failures.

Corrosivity testing of the fill materials as part of the preliminary geotechnical investigation conducted in 2012 found that the fill material is moderately corrosive.[26] Based on experience with similar sites, the geotechnical consultant also concluded that the Young Bay Mud is severely corrosive.

REGIONAL FAULTING AND SEISMIC HAZARDS

The San Francisco Bay Area is situated near the boundary between two major tectonic plates, the Pacific Plate to the southwest and the North American Plate to the northeast. Since the Miocene epoch (approximately 23 million years ago), about 200 miles of right-lateral movement[27] has occurred along the San Andreas Fault Zone to accommodate the relative movement between these two plates. The movement between the Pacific Plate and the North American Plate generally occurs across a 50-mile-wide zone extending from the San Gregorio Fault in the southwest to the Great Valley Thrust Belt to the northeast. In addition to the right-lateral slip movement between the two tectonic plates, portions of the North American Plate have moved toward each other during the last 3.5 million years, resulting in compressional forces at the latitude of San Francisco Bay.[28]

Active and Potentially Active Faults

The San Andreas, San Gregorio, Hayward, Healdsburg-Rodgers Creek, Calaveras, Concord-Green Valley, and Marsh Creek-Greenville strike-slip faults[29] are active faults[30] of the San Andreas system that predominantly accommodate lateral movement between the North American and Pacific tectonic plates in the San Francisco Bay region. Active blind- and reverse-thrust faults[31] in the San Francisco Bay region that accommodate compressional movement include the Monte Vista–Shannon and Mount Diablo faults. The closest strike-slip faults to the project site

[26] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, p. 11.
[27] The Pacific Plate and the North American Plate are moving past each other along the San Andreas Fault Zone; "right-lateral movement" means that they are moving to the right relative to each other.
[28] C. H. Fenton and C. S. Hitchcock, "Recent Geomorphic and Paleoseismic Investigations of Thrust Faults in Santa Clara Valley, California," in H. Ferriz and R. Anderson (eds.), *Engineering Geology Practice in Northern California: California Division of Mines and Geology Bulletin 210*, 2001.
[29] Strike-slip faults involve the two blocks moving parallel to each other without a vertical component of movement.
[30] An active fault is one that shows geologic evidence of movement within Holocene time (approximately the last 11,000 years).
[31] Blind-thrust faults are low-angled subterranean faults that have no surface expression. A reverse fault is one with predominantly vertical movement in which the upper block moves upward in relation to the lower block; a thrust fault is a low-angle reverse fault.

are the San Andreas, Hayward, San Gregorio, and Calaveras faults. Table 4.N.1: Major Active Faults in the Vicinity of the Project Site, summarizes the distance of these faults from the project site, and the estimated mean characteristic earthquake moment magnitude (M_w)[32] for each of these faults.

Table 4.N.1: Major Active Faults in the Vicinity of the Project Site

Fault Name	Approximate Distance from Project Site (miles)	M_w[1]
San Andreas	7	8.1
Hayward	11	7.0
Calaveras	21	7.0
Healdsburg-Rodgers Creek	23	7.1
Concord-Green Valley	24	6.8
San Gregorio (Seal Cove)	12	7.5
Marsh Creek-Greenville	31	7.0
Mount Diablo Thrust	21	6.7
Monte Vista-Shannon	24	6.5

Notes:

[1] M_w = Mean Characteristic Moment Magnitude Earthquake. Moment magnitude is related to the physical size of a fault rupture and movement across a fault and provides a physically meaningful measure of the size of a faulting event.

Source: Treadwell & Rollo, *Preliminary Geotechnical Investigation, Pier 70*, San Francisco, California, December 19, 2012

Since 1800, four major earthquakes have been recorded on the San Andreas Fault. In 1836, an earthquake with an estimated M_w of 6.4 occurred east of Monterey Bay (San Juan Bautista) on the San Andreas Fault.[33] Shortly thereafter, in 1838, an earthquake with an estimated M_w of about 7.4 occurred on the San Andreas Fault. The San Francisco earthquake of 1906 caused the most significant damage in the history of the Bay Area in terms of loss of lives and property damage. This earthquake created a surface rupture along the San Andreas Fault from Shelter Cove to San Juan Bautista, approximately 290 miles in length. It had an estimated M_w of about 7.8 and was felt 350 miles away in Oregon, Nevada, and Los Angeles. The most recent large earthquake to affect the Bay Area was the Loma Prieta earthquake on October 17, 1989. The epicenter of this

[32] An earthquake is classified by the amount of energy released, expressed as the magnitude of the earthquake. Traditionally, magnitudes have been quantified using the Richter scale. However, seismologists now use a moment magnitude (M_w) scale because it provides a more accurate measurement of the size of major and great earthquakes. Moment magnitude is directly related to the average slip and fault rupture area.

[33] California Geological Survey, Regional Geologic Mapping Program, Significant California Earthquakes, http://www.consrv.ca.gov/cgs/rghm/quakes/Pages/eq_chron.aspx. Accessed October 8, 2015.

earthquake was on the San Andreas Fault approximately 60 miles from the project site in the Santa Cruz Mountains. The earthquake had an estimated M_w of 6.9.

On the Hayward Fault, an earthquake with an estimated M_w of 7.0 occurred in 1868 on the southern segment (between San Leandro and Fremont). In 1861, an earthquake of unknown magnitude (probably an M_w of about 6.5) was reported on the Calaveras Fault. The most recent significant earthquake on this fault was the 1984 Morgan Hill earthquake with an M_w of 6.2.

The USGS estimates that it is nearly certain that an M_w 6.7 or higher earthquake will occur on one of the regional faults in the 30-year period between 2014 and 2044.[34] The USGS considers the Hayward-Rodgers Creek and Calaveras faults to be particularly ready to rupture. The likelihood of an M_w 6.7 or higher earthquake occurring on the Hayward-Rodgers Creek before 2044 is 14.3 percent; the likelihood of such an earthquake occurring on the Calaveras Fault is 7.4 percent. The northern segment of the San Andreas Fault is considered less likely to rupture partly because of the relatively recent 1906 earthquake on that fault. The likelihood of an M_w 6.7 or higher earthquake occurring on this fault before 2044 is 6.2 percent.

Fault Rupture

Fault rupture almost always follows pre-existing faults, which are zones of weakness. Surface rupture occurs when movement on a fault deep within the earth breaks through to the ground surface. Surface ruptures associated with the 1906 San Francisco earthquake extended for more than 260 miles, with displacements of up to 21 feet. There is a very low potential for fault rupture within the project site because no active faults cross the site.[35]

Ground Shaking

The intensity of seismic shaking, or strong ground motion, in the project site during an earthquake is dependent on the distance between the project site and the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the project site. Earthquakes occurring on faults closest to the project site would most likely generate the largest ground motions.

The intensity of earthquake-induced ground motions and the potential forces affecting structures within the project site can be described in terms of "peak ground acceleration," which is represented as a fraction of the acceleration of gravity (g).[36] Based on regional shaking hazard

[34] U.S. Geological Survey and U.S. Department of the Interior, *UCERF3: A New Earthquake Forecast for California's Complex Fault System, Fact Sheet 2015–3009,* March 2015.
[35] Treadwell & Rollo, *Illinois Parcels Preliminary Geotechnical Evaluation*, p. 9.
[36] Acceleration of gravity (g) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

maps in the Community Safety Element of the *San Francisco General Plan (General Plan)*, which are derived from shaking hazard mapping done by the Association of Bay Area Governments (ABAG) in 2003, the project site could experience very strong to violent ground shaking due to an earthquake along the Hayward Fault or the Peninsula segment of the San Andreas Fault. More recent mapping developed by ABAG in 2013 in conjunction with the USGS and California Geological Survey indicates the project site could be subjected to very strong ground shaking.[37] This level of ground shaking corresponds to a peak ground acceleration of about 0.25 g to 0.30 g.

Liquefaction

Liquefaction is a phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong ground shaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, sands, silty sands, and gravels within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include vertical settlement from densification, lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects.

Much of the 28-Acre Site and the northeast portion of the Illinois Parcels are located in a potential liquefaction hazard zone identified by the California Geological Survey, as shown on Figure 4.N.2: Liquefaction Zone.[38] The liquefaction zone correlates roughly with the area north and east of the historic shoreline that was filled in the late 1800s and early 1900s. The preliminary geotechnical evaluations for the 28-Acre Site and Illinois Parcels conclude that loose to medium-dense sand and gravel layers below the groundwater level could liquefy during a major earthquake on a nearby active fault and up to 4 inches of vertical ground settlement may occur, depending on the thickness and relative density of the geologic materials.[39] The anticipated settlement is expected to be erratic and to vary substantially across the site.

[37] Association of Bay Area Governments, Resilience Program. *South Francisco County Earthquake Hazard*. Available online at http://resilience.abag.ca.gov/earthquakes/sanfrancisco/. Accessed October 8, 2015.
[38] California Division of Mines and Geology, *Seismic Hazard Zones, San Francisco Quadrangle, California Division of Mines and Geology, Official Map*, effective November 17, 2000.
[39] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, p. 14.

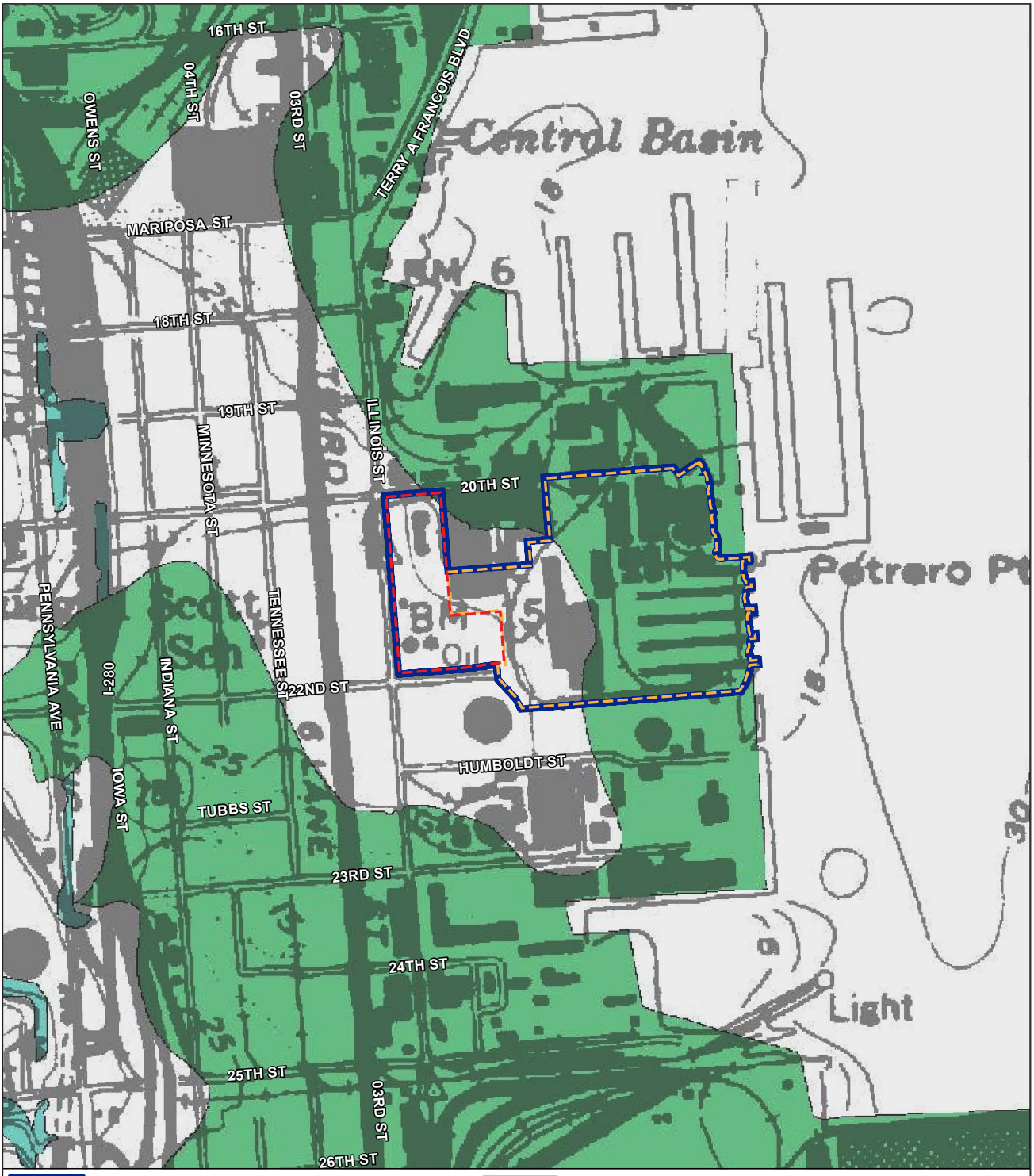


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FIGURE 4.N.2: LIQUEFACTION ZONE

Lateral Spreading

Of the liquefaction hazards, lateral spreading generally causes the most damage. This is a phenomenon in which large blocks of intact, non-liquefied soil move downslope on a liquefied substrate of large aerial extent.[40] When lateral displacement occurs, the mass moves toward an unconfined area, such as a descending slope or stream-cut bluff. Slopes ranging between 0.3 and 3 percent can displace the surface by several meters to tens of meters. Areas of observed lateral spreading in San Francisco are mainly limited to areas where fill has been placed over marsh and Young Bay Mud deposits.[41] After the 1906 earthquake on the San Andreas Fault, lateral movements of approximately 2 feet were observed at the waterfront, near the foot of Market Street, and some lateral movement apparently occurred in this area as a result of the 1868 earthquake on the Hayward Fault.[42]

The preliminary geotechnical investigation for the 28-Acre Site concluded that fill materials placed east of the historic shoreline could move laterally towards the Bay in the event of a major earthquake on one of the regional faults.[43] Areas north and south of the slipways were filled after the slipways were constructed and are underlain by fill over Young Bay Mud. The shoreline in these areas is not protected by the bulkhead, and shoreline areas could experience lateral spreading of approximately 12 inches. Lateral movement in the proposed building areas over the slipways and craneways would be on the order of approximately 6 inches because of the protection afforded by the craneway bulkhead.

Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials (particularly loose, noncompacted, and variably sandy sediments above the water table). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or Young Bay Mud. Near the foot of Market Street, settlements of as much as 4 feet occurred during the 1906 earthquake on the San Andreas Fault, and some settlement was also reported during the 1868

[40] T. L. Youd and D. M. Perkins, "Mapping Liquefaction Induced Ground Failure Potential," *Proceedings of the American Society of Civil Engineers, Journal of the Geotechnical Engineering Division*, 1978.
[41] T. L. Youd and S. N. Hoose, *Historic Ground Failures in Northern California Triggered by Earthquakes*, Geological Survey Professional Paper 993, 1978 (hereinafter referred to as "*Historic Ground Failures*").
[42] T. L. Youd and S. N. Hoose, *Historic Ground Failures*.
[43] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, pp. 14 and 15.

earthquake on the Hayward Fault.[44] The preliminary geotechnical investigation for the 28-Acre Site estimates that in the event of a major earthquake on one of the regional faults, up to 4 inches of earthquake-induced settlement could occur in areas of the project site that were filled in the late 1800s and early 1900s.[45]

Earthquake-Induced Landslides

Earthquake motions can also induce substantial stresses in slopes, causing earthquake-induced landslides or ground cracking when the slope fails. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. The 1989 Loma Prieta earthquake triggered thousands of landslides over an area of 770 square miles. The project site and vicinity are relatively flat except for Irish Hill and nearby bedrock cuts; no landslides occurred on the project site as a result of the Loma Prieta earthquake, and there are no mapped zones of potential earthquake-induced landslides at or immediately adjacent to the project site.[46] The landslide susceptibility map of the Community Safety Element of the *General Plan* also indicates that the project site is not located within a potential landslide hazard area. However, the southwest corner of the site, near the remnant of Irish Hill, is mapped by the USGS as "few landslides." The geotechnical evaluation of the Illinois Parcels concluded that Irish Hill and exposed bedrock cuts could be subject to sloughing and rock fall.[47] This is further described under "Slope Failure" on p. 4.N.7.

REGULATORY FRAMEWORK

STATE

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting in structures for human occupancy. In accordance with this act, the State geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and has published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault

[44] T. L. Youd and S. N. Hoose, *Historic Ground Failures*.
[45] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, p. 14.
[46] California Department of Conservation, Division of Mines and Geology, *State of California Seismic Hazard Zones, City and County of San Francisco, Official Map*, November 17, 2000 (hereinafter referred to as "Official Map"). Available online at http://gmw.consrv.ca.gov/shmp/download/quad/SAN_FRANCISCO_NORTH/maps/ozn_sf.pdf. Accessed May 3, 2013.
[47] Treadwell & Rollo, *Illinois Parcels Preliminary Geotechnical Evaluation*, p. 10.

trace because many active faults are complex and consist of more than one branch that may experience ground surface rupture. The act does not apply to the Proposed Project because no active faults cross the project site or any other location in San Francisco.[48]

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The act directs the California Geological Survey to identify and map areas prone to the earthquake hazards of liquefaction and earthquake-induced landslides. For structures intended for human occupancy (inhabited for 2,000 hours per year or more),[49] the act requires that project sponsors perform site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures prior to permitting of most developments within the zones of required investigation. The Proposed Project would be subject to this act because it is located within a mapped liquefaction zone of required investigation.[50]

California Building Code

The California Building Code has been codified in the California Code of Regulations as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the California Building Code is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures within its jurisdiction. The California Building Code is based on the International Building Code, previously known as the Uniform Building Code. The 2013 California Building Code is based on the 2012 International Building Code published by the International Code Conference.

In addition, the California Building Code contains necessary California amendments, which are based on reference standards obtained from various technical committees and organizations such as the American Society of Civil Engineers (ASCE), Structural Engineering Institute (SEI), American Institute of Steel Construction, and American Concrete Institute. ASCE/SEI "Minimum Design Loads for Building and Other Structures" (ASC/SEI 7-10) provides requirements for general structural design and includes means for determining earthquake loads

[48] California Geological Survey, *Table 4, Cities and Counties Affected by Alquist-Priolo Earthquake Fault Zones as of January 2010*. Available online at http://www.conservation.ca.gov/cgs/rghm/ap/pages/affected.aspx. Accessed October 8, 2015.

[49] Title 14 of the California Code of Regulations, Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year.

[50] California Department of Conservation, Division of Mines and Geology, Official Map.

as well as other loads (flood, snow, wind, etc.) for inclusion into building codes. The provisions of the California Building Code apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

LOCAL

City and County of San Francisco and Port of San Francisco Building Codes

The full 2013 building codes of the City and County of San Francisco and the Port of San Francisco consist of the 2012 International Building Code, as adopted and amended by State of California and as further amended by the City and County of San Francisco or the Port of San Francisco to address local requirements. The City and County of San Francisco amendments have been adopted by the San Francisco Board of Supervisors and the Port of San Francisco amendments have been adopted by the Port Commission. The San Francisco Building Code would apply to development projects constructed in the Hoedown Yard, which is under the jurisdiction of the San Francisco Department of Building Inspection (DBI). The remainder of the project site is owned by the Port, and the Port of San Francisco Building Code would apply to construction of development projects in these areas.

Under Section 1803.2 of the building codes, a site-specific geotechnical investigation is required for each building to provide information about geotechnical hazards that must be addressed in the project's design.[51] Sections 1803.3 through 1803.5 specify what topics must be addressed by the geotechnical investigation. According to Section 1803.6, the geotechnical report must address the following information:

- The characteristics of the site soils and rock strata;
- The occurrence of groundwater;
- Recommendations for foundation type and design criteria for the foundation system, including but not limited to bearing capacity of the natural or compacted soil; provisions to address the effects of expansive soil; provisions to address the effects of liquefaction, differential settlement, and varying strength; and effects of adjacent loads;
- Expected total and differential settlement;
- Deep foundation information;
- Special design and construction provisions for foundations of structures founded on expansive soils, as necessary;
- Requirements for fill material placement and testing; and
- The potential for geotechnical and seismic hazards to occur (slope instability, liquefaction, total and differential settlement, and surface displacement due to faulting).

[51] City and County of San Francisco Department of Building Inspection, Information Sheet, Geotechnical Report Requirements, May 20, 2015.

The soil investigation and recommendations must be approved by DBI for sites under the jurisdiction of this department and by the Port for sites on Port property. Implementation of the recommendations of the geotechnical report must be incorporated into the design of proposed structures.

The earthquake design requirements of the building codes take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site. The classifications range from SDC A (very small seismic vulnerability) to SDC E (very high seismic vulnerability and near a major fault). Design specifications are determined based on the SDC.

For sites with an SDC of C through F, the investigation must also address seismic slope instability, liquefaction, total and differential settlement, and surface displacement due to faulting or seismically induced lateral spreading or lateral flow. For sites with an SDC of D through F, the investigation must also address lateral earth pressures, the potential for liquefaction, and the potential consequences of liquefaction including total and differential settlements as well as the effects of lateral soil movement and flotation. Recommendations must be included for the appropriate foundation type, structural systems, ground stabilization, or any combination of these to address the effects of liquefaction and related phenomena.

San Francisco Site Permit Process

For projects in San Francisco that are not under Port jurisdiction, which would include development on the Hoedown Yard, DBI reviews Site Permit submittals based on initial conceptual design drawings to ensure that new structures can be designed and constructed to comply with current building code requirements, as discussed in DBI Administrative Bulletin AB-032 (Site Permit Processing).[52] The first step of the Site Permit process is submittal of a Site Permit submittal package that includes preliminary drawings and documentation. Structural Design Criteria Documents are required if the proposed design is performance based, as noted in Department of Building Inspection Administrative Bulletin AB-082. The Site Permit is not issued until DBI is satisfied that the submittal package is capable of meeting all code requirements.

Issued Site Permits are not authorized for construction and stamped by the Department of Building Inspection as such. Actual construction authorization of specific elements of a project are addressed through more detailed addenda submittals to the Site Permit and these more

[52] City and County of San Francisco Department of Building Inspection, *Administrative Bulletin AB-032, Site Permit Processing*, June 4, 2012. Available online at http://sfDBI.org/sites/sfDBI.org/files/AB-032%20Re-approved%20051612%20Signed%20060412%20posted.pdf. Accessed January 5, 2016.

detailed drawings are checked for code compliance before they are approved. Addenda to the Site Permit are required for each specific phase of construction, including grading, foundation design, and superstructure design (basic building and structural frame), and for mechanical and electrical systems, and any work excluded from the superstructure and mechanical and electrical system addenda (a final addendum). Each addendum must be approved separately by DBI for that phase of the construction process to proceed; only work shown on approved addenda bearing the DBI "Stamp of Approval" may proceed in accordance with the Site Permit process. Once an addendum is approved, DBI is responsible for conducting inspections to ensure compliance with the approved addenda plans and the San Francisco Building Code as well as the Mechanical, Electrical, Plumbing, Energy, and Green Building Codes.

Port of San Francisco Building Permit Process

For projects under Port jurisdiction, including projects in all portions of the project site except the Hoedown Yard, the applicant must submit a building permit application and required drawings and documents to the Port's Building Permit Group (BPG). The permit application is reviewed by the BPG to confirm compliance with the Port of San Francisco Building Code and applicable design requirements. As part of this process, the BPG reviews structural and/or civil engineering calculations for the planned building. Depending on the scope, the application may also be routed to other Port and City divisions for approval. Once a permit application has been approved, the BPG is responsible for conducting inspections to ensure compliance with the Port of San Francisco Building Code as well as the Mechanical, Electrical, and Plumbing Codes.

San Francisco General Plan

The Community Safety Element of the *General Plan* includes Objective 1, which requires the City to "reduce structural and non-structural hazards to life safety and minimize property damage resulting from future disasters." The Community Safety Element contains the following relevant seismic and geologic policies in support of this objective:

Policy 1.1	Continue to support and monitor research about the nature of seismic hazards in the Bay Area, including research on earthquake prediction, warning systems and ground movement measuring devices, and about earthquake resistant construction and the improved performance of structures.
Policy 1.3	Assure that new construction meets current structural and life safety standards.
Policy 1.4	Use best practices to review and amend at regular intervals all relevant public codes to incorporate the most current knowledge of structural engineering regarding existing buildings.
Policy 1.5	Support development and amendments to building code requirements that meet City seismic performance goals.

Policy 1.6	Consider site soils conditions when reviewing projects in areas subject to liquefaction or slope instability.
Policy 1.7	Consider information about geologic hazards whenever City decisions are made that will influence land use, building density, building configurations or infrastructure.
Policy 1.15	Abate structural and non-structural hazards in City-owned structures.
Policy 1.18	Identify and replace vulnerable infrastructure and critical service lifelines in high-risk areas.

The Community Safety Element includes maps of potential earthquake hazards, including ground shaking, liquefaction, and earthquake-induced landslides.

PALEONTOLOGICAL RESOURCES REGULATORY FRAMEWORK

A variety of Federal and State regulations and policies protect paleontological resources. These include NEPA, CEQA, the American Antiquities Act of 1906, the National Natural Landmarks Program, and the Public Resources Code. Under California law, paleontological resources are included under CEQA and are required to be examined as part of the CEQA process. The City has no policies directly protecting paleontological resources, but uses the CEQA process to address potential adverse effects.

CEQA requires that paleontological resources be addressed during the EIR process. CEQA Guidelines, Appendix G, states, in part, that a project will "normally" have a significant effect on the environment if, among other things, it will disrupt or adversely affect a paleontological site, except as part of a scientific study. If paleontological resources are identified during the initial project scoping studies (such as an Initial Study or in a comment on the Notice of Preparation) as being on the project site, the Lead Agency must take those resources into consideration when evaluating the potential effects of the project. In the context of the Public Resources Code (Section 5097.5), fossils of vertebrates and evidence of their environment generally are considered important (i.e., significant) paleontological resources.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on geology and soils. Implementation of the Proposed Project would have a significant effect on geology and soils if the project would:

N.1 Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);
- Strong seismic ground shaking;
- Seismic-related ground failure, including liquefaction; or
- Landslides;

N.2 Result in substantial soil erosion or the loss of topsoil;

N.3 Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;

N.4 Be located on expansive soil, as defined in the California Building Code, creating substantial risks to life or property;

N.5 Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;

N.6 Change substantially the topography or any unique geologic or physical features of the site; or

N.7 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Due to the nature of the Proposed Project, there would be no impact related to Criterion N.5, soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems, because the Proposed Project would connect to the combined sewer system (the wastewater conveyance system for San Francisco), and would not use septic tanks or other on-site land disposal systems for sanitary sewage.

APPROACH TO ANALYSIS

This analysis evaluates the Proposed Project's potential effects related to geology and soils and paleontological resources. Potential seismic impacts are assessed with respect to exposure of people or structures to geologic hazards, including fault rupture, ground shaking, liquefaction and other earthquake-related ground failures, and landslides. The impact analysis also assesses potential impacts related to soil erosion, unstable geologic units, problematic soils, and alteration of topography or effects on unique geologic features. The impact analysis assumes that all construction and operations would be completed in compliance with applicable regulations, including the San Francisco and Port of San Francisco Building Codes, and stormwater permitting requirements. If compliance with these standards would ensure that impacts related to geology and soils would be less than significant, then no mitigation is necessary.

PROJECT FEATURES

Those features of the Pier 70 Mixed-Use District Project that could have an effect on geology and soils are the same or substantially similar under the Maximum Commercial Scenario and the Maximum Residential Scenario, the three options for sewer/wastewater treatment, and the three options for grading around Building 12 that are analyzed in this EIR. To the extent that these features may differ somewhat from one to another, they are generally included and accounted for in an analysis of maximum ground disturbance within the project site. The same geologic and seismic regulatory requirements and mitigation measures applicable to the Proposed Project are equally applicable under the Proposed Project's scenarios and options. Therefore, this impact analysis of geologic and seismic impacts applies to both scenarios and all options; no separate analysis of impacts under each scenario or option is necessary. The specific elements that could result in geologic and seismic impacts include proposed grading and excavation for the construction of the 15- to 27-foot-deep basements planned on most of the parcels; construction of the new residential and commercial buildings; renovation of Buildings 2, 12, and 21; street improvements, including the new 21st Street which would potentially involve grading through the northernmost extent of the 35-foot-tall Irish Hill remnant; construction of the new 20th Street Pump Station northeast of the project site which includes a basement approximately 20 feet bgs; and installation of new utilities for potable water, recycled water, fire protection water, wastewater, stormwater, electricity, and natural gas. Lastly, the Proposed Project includes raising the grade of the 28-Acre Site and low-lying portions of the Illinois Parcels by adding up to 5 feet of fill to help protect against flooding and projected future sea level rise.

IMPACT EVALUATION

Impact GE-1: The Proposed Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, seismic ground shaking, seismically induced ground failure, or seismically induced landslides. ***(Less than Significant)***

Fault Rupture

The project site is not located within an Alquist-Priolo Earthquake Fault Zone or traversed by an active fault;[53] therefore, impacts related to fault rupture would be less than significant. No mitigation is necessary.

[53] Treadwell & Rollo, *Illinois Parcels Preliminary Geotechnical Evaluation*, p. 9.

Ground Shaking

Based on regional shaking hazard mapping by ABAG, the project site would experience very strong ground shaking due to an earthquake on one of the regional faults.[54] However, construction of the Proposed Project would not expose people or structures to substantial adverse effects related to ground shaking because the proposed structures would be designed and constructed in accordance with the most current San Francisco and Port of San Francisco Building Codes.

The structural design of the buildings would be developed using information obtained from the site-specific geotechnical investigation report that would be prepared in accordance with Chapter 16 of the San Francisco and Port of San Francisco Building Codes, which specifies that every structure "shall be designed and constructed to resist the effects of earthquake motions." The structural design requirements for the buildings would be based on the SDC of each building, and determined in accordance with the procedures specified in Chapter 16 of the building codes, Structural Design. The design would be subject to review and approval by DBI or the Port as part of the building permit approval processes described above under "San Francisco Site Permit Process" and "Port of San Francisco Building Permit Process," pp. 4.N.18-4.N.19. Incorporation of the appropriate engineering and design features in accordance with the building codes would ensure that the new structures would not suffer substantial damage; that substantial debris such as building exterior finishes or windows would not separate from the building; that building occupants would be able to safely vacate the building following an earthquake; and that pedestrians and other bystanders would not be injured. Therefore, impacts related to ground shaking would be less than significant. No mitigation is necessary.

Liquefaction and Earthquake-Induced Settlement

As discussed in "Liquefaction" in the Environmental Setting on p. 4.N.12 and shown on Figure 4.N.2 on p. 4.N.13, most of project site north and east of the historic shoreline is located in an area of liquefaction potential identified by the California Department of Conservation under the Seismic Hazards Mapping Act of 1990.[55] The preliminary geotechnical evaluations for the 28-Acre Site and Illinois Parcels conclude that loose to medium-dense sand and gravel layers below the groundwater level could liquefy during a major earthquake on a nearby active fault and up to 4 inches of vertical ground settlement may occur, depending on the thickness and relative density of the geologic materials. The anticipated settlement is expected to be erratic and to vary

[54] Association of Bay Area Governments, Resilience Program, San Francisco County Earthquake Hazard, 2015. Available online at http://resilience.abag.ca.gov/earthquakes/sanfrancisco/. Accessed September 27, 2015.
[55] California Department of Conservation, Division of Mines and Geology, Official Map.

substantially across the site. Therefore, structures and utilities constructed under the Proposed Project could be subject to both liquefaction and earthquake-induced settlement.

However, Section 1803.7 of the San Francisco and Port of San Francisco Building Codes would require that the site-specific geotechnical report prepared for the Proposed Project address the potential for liquefaction in accordance with the guidelines provided in Special Publication 117A of the California Department of Conservation.[56] Building Code Section 1803.5.12 provides further specifications for determining the potential for liquefaction and related hazards and assessing the potential consequences such as total and differential settlement, lateral soil movement, lateral soil loads on foundations, and reductions in the load-bearing capacity of the soil. Measures to address the effects of liquefaction must be recommended in the site-specific geotechnical report. Such measures must address the appropriate foundation type and depths and selection of the appropriate structural systems to accommodate anticipated ground displacements and forces. If ground stabilization is used, the foundation and structural design would be based on stabilized conditions.

The preliminary geotechnical evaluations for the 28-Acre Site and Illinois Parcels concluded that the appropriate foundation design for individual buildings constructed under the Proposed Project would depend on the depth to bedrock, presence of liquefiable materials, and the individual characteristics of the building (e.g., size, height, and depth of below-grade features). Although buildings constructed in areas of shallow bedrock feasibly would be supported on spread footings or mat foundations, buildings constructed within the potential liquefaction area would need to be supported on deep foundation systems using piles founded on the underlying bedrock along with structural slabs designed to accommodate the anticipated total and differential settlement. Mat foundations may be feasible where the basement excavation extends through the Young Bay Mud to bedrock. Buildings that straddle the historic shoreline should be supported on a combination of shallow and deep foundation systems. For buildings overlying the craneways, the piles would be installed through holes cored through the buried concrete slabs and a concrete pile cap would span the top of the piles. A grade beam would span the buried slipways to provide support for buildings above the slipways. The historic buildings to be relocated and/or rehabilitated, including Buildings 2, 12, and 21, would be supported on shallow footings and grade beams.[57]

Use of foundations supported by the underlying bedrock and grade beams would ensure that the proposed structures throughout the site would withstand differential settlement that could result from liquefaction. In addition, the site-specific geotechnical report that would be required by the

[56] California Department of Conservation, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A, 2008. Note that Special Publication is an update of the 1997 Special Publication 117 that is referenced in Section 1803.7 of the San Francisco Building Code.

[57] Michael Gemmill, S.E., Nabih Youssef Structural Engineers, email to Julie Barlow, SCWA, April 21, 2016.

San Francisco and Port of San Francisco Building Codes could include additional recommendations to address the effects of liquefaction, including appropriate design of new utilities. The recommendations must be incorporated into the project design and would be subject to review and approval by DBI or the Port as part of the building permit approval process. Appropriate design of the building foundation, site utilities, and superstructure systems in accordance with the recommendations of the site-specific geotechnical report would ensure that impacts related to liquefaction and earthquake-induced settlement would be less than significant. No mitigation is necessary.

Lateral Spreading

As discussed in "Lateral Spreading" in the Environmental Setting on p. 4.N.14, the preliminary geotechnical investigation for the 28-Acre Site concluded that without improvements, the fill materials placed east of the historic shoreline could move laterally towards the Bay in the event of a major earthquake on one of the regional faults.[58] Areas north and south of the slipways were filled after the slipways were constructed and are underlain by fill over Young Bay Mud, and these shoreline areas that are not protected by the craneway bulkhead could experience lateral spreading of approximately 12 inches. Lateral movement in the proposed building areas over the slipways and craneways would be on the order of approximately 6 inches because of the protection afforded by the craneway bulkhead and timber piles. However, the preliminary geotechnical investigation concludes that lateral movement in this area would not affect the performance of structures constructed over the slipways and craneways.

As discussed above on p. 4.N.24, the site-specific geotechnical report for the Proposed Project that would be conducted in accordance with the San Francisco and Port of San Francisco Building Codes and Special Publication 117A of the California Department of Conservation would address the potential for lateral displacement to occur at a greater level of detail in regard to the proposed design of specific buildings and would provide recommendations to address the potential effects of lateral displacement.

As discussed in "Geotechnical Stabilization" in Chapter 2, Project Description, p. 2.69, as part of the building permit approval process, the project sponsor would be required to implement measures to control the amount of lateral displacement that could occur. These measures could include actions such as reinforcing the existing slope with a structural wall or ground improvements. Structural wall solutions may include, but are not limited to, tied-back sheet pile walls (interlocking sheets of steel), rows of secant piles (interlocking piles), and king-pile walls (wider piles connected by sheeting). Ground improvements may consist of ground improvement treatments such as deep soil mixing to add a cement slurry to strengthen the existing soil or

[58] Treadwell & Rollo, *Pier 70 Preliminary Geotechnical Investigation*, p. 14.

vibratory methods such as vibro-compaction, vibro-replacement, and dynamic compaction to densify and strengthen the existing soil. The proposed improvements would be constructed on Port property and their design would be submitted to the Port for review and approval as part of the building permit approval process. Therefore, impacts related to lateral spreading would be less than significant. No mitigation is necessary.

Earthquake-Induced Landslides

The project site is not located within a zone of earthquake-induced landslide susceptibility identified by the California Department of Conservation under the Seismic Hazards Mapping Act of 1990.[59] Therefore, there would be no impact related to earthquake-induced landslides. No mitigation is necessary. Impacts associated with rock fall hazards due to bedrock cuts and the remnant of Irish Hill are addressed below in Impact GE-3.

Impact GE-2: The Proposed Project would not result in substantial erosion or loss of topsoil. ***(Less than Significant)***

Soil movement for foundation and basement excavation, placement of fill to raise the site grade, and construction of shoreline improvements could create the potential for wind- and water-borne soil erosion. However, future developers of roadways, utilities, open space improvements, and the individual parcels and building sites would be required to implement an erosion and sediment control plan for construction activities, including any of the three grading options for Building 12, in accordance with Article 4.1 of the San Francisco Public Works Code and the Construction General Stormwater Permit (discussed in more detail in Section 4.O, Hydrology and Water Quality, pp. 4.O.46-4.O.54) to reduce the impact of runoff from the construction site. The San Francisco Public Utilities Commission must review and approve the erosion and sediment control plan completed in accordance with Article 4.1 prior to implementation, and would conduct periodic inspections to ensure compliance with the plan. Once development occurs, the project site would be occupied by buildings or covered with pavement or landscaped areas. Therefore, impacts related to soil erosion would be less than significant during both construction and operation of the Proposed Project. No mitigation is necessary.

Previous development at the 28-Acre Site and the Illinois Parcels would have resulted in removal of any topsoil (a fertile soil horizon that typically contains a seed base) during construction. Therefore, there would be no impact related to loss of topsoil. No mitigation is necessary.

[59] California Department of Conservation, Division of Mines and Geology, Official Map.

Impact GE-3: The project site would not be located on a geologic unit or soil that is unstable, or that could become unstable as a result of the Proposed Project. ***(Less than Significant with Mitigation)***

Settlement During Construction

The Proposed Project could induce ground settlement during construction as a result of excavation for construction of utilities as well as for the building foundations and basement levels, construction dewatering, and heave during pile installation. These potential effects are described below, followed by a discussion of San Francisco and Port of San Francisco requirements that would be implemented to ensure that unstable conditions do not result during construction and that impacts related to settlement during construction would be less than significant.

Excavation

Construction of individual buildings under the Proposed Project would require excavation to 15 to 27 feet below ground for the construction of basements. Excavation also would be required for installation of underground utilities. Demolition of the subterranean portions of Slipways 5 through 8 would require excavation adjacent to the Bay shoreline. During excavation, the bedrock, artificial fill, marsh deposits, and Young Bay Mud (described in "Project Site Topography and Geology" on pp. 4.N.2-4.N.5) could become unstable, potentially causing settlement of adjacent structures, including adjacent streets and utilities, as well as buildings in the existing 20th Street Historic Core, the historic buildings to be retained on the project site (Buildings 2, 12, and 21), and buildings constructed as part of the Proposed Project during earlier development phases.

Temporary shoring would be required to maintain stable sidewalls in the excavations and protect the adjacent public streets/sidewalks and nearby buildings. Where rock is shallow, the preliminary geotechnical evaluations determined that it might be possible to use rock nails, shotcrete facing, or conventional soldier piles and lagging to retain sides of the excavations. Where shallow excavations do not extend into bedrock, soldier pile and timber lagging also may be possible, but deeper excavations would likely require more rigid shoring systems such as a soil/cement mixture or tied-back or braced walls.

The final shoring requirements would be addressed in the site-specific geotechnical report required by Section 1803 of the San Francisco and Port of San Francisco Building Codes. In accordance with building code requirements, the contractor would submit shoring drawings and calculations, subject to review and approval by DBI or the Port as part of the building permit approval process. A separate permit would be required for underpinning of adjacent features.

Construction-Related Dewatering

As stated in "Groundwater" on p. 4.N.6, groundwater is relatively shallow (encountered at depths of 6 to 29 feet bgs). Therefore, there is the potential for substantial water inflow into the excavations during construction of the individual buildings. Where unconsolidated soils such as the artificial fill and Young Bay Mud are present, dewatering could potentially result in settlement of adjacent structures, including adjacent streets and utilities, as well as buildings in the existing 20th Street Historic Core, the historic buildings to be retained on the project site (Buildings 2, 12, and 21), and buildings constructed as part of the Proposed Project during earlier development phases. Although a watertight shoring system could be used during excavation of structures, dewatering of excavations for installation of utilities could be required. The construction dewatering requirements would be reviewed by DBI and the Port to determine if additional measures would be needed to address potential settlement issues during construction. Note that water quality impacts associated with construction-related dewatering are discussed in Section 4.O, Hydrology and Water Quality.

Heave as a Result of Pile Driving

The Proposed Project could include driving of displacement piles during construction of individual buildings; for protection against lateral spreading; and for the construction of shoreline improvements in Reach II. This pile driving may cause the ground to heave up to several inches, and the heave could adversely affect structures adjacent to the pile driving work, such as existing utilities and streets as well as the 20th Street Historic Core, the existing historic buildings that would be retained on the project site (Buildings 2, 12, and 21), and buildings constructed as part of the Proposed Project during earlier development phases. Recommendations regarding the potential for heave would be reviewed by DBI or the Port as part of the building permit approval process. DBI or the Port would determine subsequent monitoring required to address the potential for heave as part of the building permit review and approval process.

San Francisco and Port of San Francisco Requirements

As discussed above in "City and County of San Francisco and Port of San Francisco Building Codes" on pp. 4.N.17-4.N.18, DBI or the Port would require a site-specific geotechnical report for the specific developments to be constructed under the Proposed Project in accordance with Section 1803 of the San Francisco and Port of San Francisco Building Codes. DBI or the Port would review the report to ensure that the potential settlement effects of excavation, construction-related dewatering, and pile driving are adequately addressed.

With implementation of the recommendations provided in the site-specific geotechnical report, subject to review and approval by DBI or the Port as part of the building permit approval process,

as well as monitoring by the project sponsor (if required), impacts related to the settlement and subsidence due to construction on soil that is unstable, or that could become unstable as a result of excavation, dewatering, and pile driving, would be less than significant. No mitigation is necessary.

Settlement and Unstable Conditions During Operation

Once constructed, differential settlement within the Young Bay Mud could occur as a result of placement of up to 5 feet of soil to raise the site grade. In addition, cuts made into the bedrock of the remnant of Irish Hill for the construction of the new 21st Street could become unstable if not supported. Rock fall hazards also would be present near the remnant of Irish Hill and exposed bedrock cuts. The dilapidated pier extending from the project site into the Bay could also fail if it is used by site occupants and visitors. These impacts are discussed below.

Long-term dewatering would not be required because the below-grade walls and basement slabs would be waterproofed and designed to withstand the anticipated hydrostatic pressure in accordance with the recommendations of the preliminary geotechnical evaluations that have been completed for the Proposed Project. The design of these features would be further evaluated in the site-specific geotechnical report required under Section 1803 of the San Francisco and Port of San Francisco Building Codes.

Settlement Due to Placement of Fill

The preliminary geotechnical evaluations for the Proposed Project estimate that the placement of fill throughout the site to raise site grades by up to 5 feet, as described in "Site Grading" in Chapter 2, Project Description, pp. 2.67-2.69, would generate large amounts of total and differential settlement in areas underlain by Young Bay Mud. These settlement effects would be restricted to those areas north and east of the historic 1869 shoreline that are underlain by artificial fill, marsh deposits, and Young Bay Mud. The bedrock that is near the surface in the remainder of the site consists of hard rock, and placement of structures on this rock would not result in settlement.

Therefore, the geotechnical evaluations recommend that shallow foundations for the proposed buildings not be used in areas underlain by Young Bay Mud. Rather, as described in Impact GE-1, p. 4.N.24, the geotechnical evaluations recommend the use of deep foundations such as piles extending to bedrock to support major structures such that they would not experience unacceptable levels of settlement. Mat foundations would be suitable only at building sites where the excavation extends through the Young Bay Mud.

The proposed streets and non-building improvements also could experience settlement in areas underlain by Young Bay Mud where fill is placed. The magnitude of settlement would depend on

several factors, including the thickness of fill, the thickness of Young Bay Mud, and the state of consolidation of the Young Bay Mud. Settlement of this nature is common to sites underlain by Young Bay Mud and can be addressed by several methods, including designing the improvements to tolerate the settlement; placing fill early in the construction schedule and allowing it to consolidate the Young Bay Mud before constructing the proposed improvements; pre-consolidating the Young Bay Mud to accelerate settlement; and using light-weight fill to reduce the impact of the fill on the Young Bay Mud.

Other potential options for addressing consolidation of the Young Bay Mud underlying design loads include installing wick drains and surcharging areas where grades will be raised or relatively light structures are planned. Wick draining is accomplished by installing closely spaced artificial vertical drainage paths which would allow water to flow from the Young Bay Mud layer to the surface, thus decreasing the consolidation time to a matter of months. These artificial drainage paths are typically 4 inches wide and consist of a central plastic core surrounded by a thin geotextile filter jacket. The pore water that is conveyed to the surface is not anticipated to generate surface runoff, but rather would saturate the existing fill zone above the groundwater table. Surcharging is accomplished by temporarily adding soil or rock placed in lifts above the proposed site grade. The extra load would exceed the load of the planned development and would cause the Young Bay Mud to undergo settlement in a much shorter amount of time than would be expected to occur without surcharging. Once the target design settlement is achieved, the additional surcharge material would be removed.

The specific intervention would be further refined in the site-specific geotechnical report and would be subject to review and approval by DBI or the Port as part of the building permit approval process. Therefore, impacts related to settlement following construction of the proposed buildings would be less than significant. No mitigation is necessary.

Unstable Bedrock Cuts and Irish Hill Remnant

The existing near-vertical cuts in the serpentinite bedrock of the project site, including the remnant of Irish Hill, could be subject to rock fall hazards, as noted in the preliminary geotechnical evaluation for the Illinois Parcels. Any rock fall could potentially damage nearby structures, including buildings on Parcels PKS, C-1, and C-2, or injure site occupants, particularly visitors to the Irish Hill playground and pedestrians on 21st Street. Therefore, rock fall hazards would be significant. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-GE-3a: Reduction of Rock Fall Hazards, which requires the use of active controls or setbacks to reduce risks associated with rock falls.

Although a portion of the northern spur of the remnant of Irish Hill, which stands approximately 35 feet tall, would be removed for construction of the new 21st Street, as discussed in "Site

Grading" in Chapter 2, Project Description, pp. 2.69-2.69, the newly exposed bedrock cuts would not be subject to rock fall hazards because retaining walls would be constructed to protect the sidewalk along 21st Street. The retaining walls would prevent rock fall from occurring.

Mitigation Measure M-GE-3a: Reduction of Rock Fall Hazards

The project sponsors shall prepare a site-specific geotechnical report(s), subject to review and approval by the Port, that evaluates the design and construction methods proposed for Parcels PKS, C-1, and C-2, the Irish Hill playground, and 21st Street. The investigations shall determine the potential for rock fall hazards. If the potential for rock fall hazards is identified, the site-specific geotechnical investigations shall identify measures to minimize such hazards to be implemented by the project sponsors. Possible measures to reduce the impacts of potential rock fall hazards include, but are not limited to, the following:

- Limited regrading to adjust slopes to stable gradient;
- Rock fall containment measures such as installation of drape nets, rock fall catchment fences, or diversion dams; and
- Site design measures such as implementing setbacks to ensure that buildings and public uses are outside areas that could be subject to damage as a result of rock fall.

Implementation of Mitigation Measure M-GE-3a would not result in significant impacts to the contributory remnant of Irish Hill feature. Any regrading or adjustment to slopes needed to stabilize the gradient would not substantially alter the form of the remnant. Installation of rock fall containment measures, including installation of drape nets, catchment fences, or diversion dams would not alter the physical form of the remnant, and requiring design measures such as setbacks for buildings and public use would not alter the physical conditions of the remnant.

Dilapidated Pier

A dilapidated pier extends from the project site into the Bay immediately northeast of the slipways. The pier is constructed of creosote-treated wood and is not likely structurally sound. As described in "Project Site Vicinity" in Chapter 2, Project Description, p. 2.7, this pier would remain in place once the Proposed Project is constructed; no planned alterations are anticipated under the Proposed Project. Although the pier is not a geologic unit, its use by future site occupants and visitors could cause it to fail due to the increased loads, which would be a significant impact. Implementation of Mitigation Measure M-GE-3b: Signage and Restricted Access to Pier 70 would reduce this impact to a less-than-significant level by preventing access to the pier.

Mitigation Measure M-GE-3b: Signage and Restricted Access to Pier 70

Prior to issuance of the first certificate of occupancy under the Proposed Project, the project sponsors shall install a gate or an equivalent measure to prevent access to the existing dilapidated pier at the project site. A sign shall be posted at the potential access

point informing the public of potential risks associated with use of the structure and prohibiting public access.

Impact GE-4: The Proposed Project would not create substantial risks to life or property as a result of locating buildings or other features on expansive or corrosive soils. ***(Less than Significant)***

Much of the project site is underlain directly by bedrock, which is not expansive. The artificial fill beneath the project site is sandy and gravelly and would not be expansive. The Young Bay Mud is below the water table and is permanently saturated; therefore, it would not be subject to moisture changes that would cause expansion and contraction of the clay materials. Further, any backfill materials used for the Proposed Project would have a low expansion potential and would be adequately compacted in accordance with the recommendations of the geotechnical report prepared for the Proposed Project. Although corrosive soils have been identified at the project site, as discussed in "Corrosive Soils" on pp. 4.N.8-4.N.9, buried features of the Proposed Project would be constructed to resist corrosion in accordance with the San Francisco and Port of San Francisco Building Codes. Therefore, impacts related to problematic soils would be less than significant. No mitigation is necessary.

Impact GE-5: The Proposed Project would not substantially change the topography or any unique geologic or physical features of the site. ***(Less than Significant)***

The 35-foot-tall Irish Hill remnant is not considered a unique geologic or physical feature because it does not embody distinctive characteristics of any regional or local geologic principles; does not provide a key piece of information important to geologic history; does not contain minerals not known to occur elsewhere in the county; and is not used as a teaching tool. The remnant of Irish Hill is a prominent historic topographic feature in San Francisco. However, it was nearly leveled by extensive blasting and quarrying during the late 1800s and early 1900s, as described in "Project Site Topography and Geology," p. 4.N.2. Therefore, the existing hill is not representative of the original topography. In addition, construction of the new 21st Street would remove only the northern spur of the hill, and would not substantially alter the existing topography. Irish Hill is a contributing landscape feature of the Union Iron Works Historic District; the potential effects on this historic resource are addressed in Section 4.D, Cultural Resources.

As described in "Site Grading," in Chapter 2, Project Description, p. 2.67-2.69, site grades would be increased by up to 5 feet to prevent inundation due to sea level rise. However, this grading would not result in a substantial change in topography because no existing slopes would be eliminated and no new slopes would be created as a result of raising the site grade. Therefore, impacts related to alteration of topography and unique geologic or physical features of the site would be less than significant. No mitigation is necessary.

Impact GE-6: The Proposed Project would directly or indirectly destroy a unique paleontological resource or site. ***(Less than Significant with Mitigation)***

Given that sedimentary rocks of the Franciscan Complex have produced significant fossils important for understanding the age, depositional environments, and tectonic history the San Francisco area, paleontological resources could exist in the sedimentary rocks of the Franciscan Complex that underlie the project site. Proposed Project construction activities, including excavation for the planned basement levels and anticipated pile-driving activities, could disturb significant paleontological resources if such resources are present within the project site. Site disturbance could impair the ability of the project site to yield important scientific information. Unless mitigated, implementation of the Proposed Project could impair the significance of unknown paleontological resources on the project site; this would be considered a significant impact under CEQA.

Implementation of Mitigation Measure M-GE-6: Paleontological Resources Monitoring and Mitigation Program would ensure that the Proposed Project would not cause a substantial adverse change to the scientific significance of a paleontological resource and would reduce this impact to a less-than-significant level. This mitigation measure calls for a qualified paleontologist to implement an approved Paleontological Resources Monitoring and Mitigation Program during construction and earth-moving activities in areas where construction activities would disturb sedimentary rocks of the Franciscan Complex. Monitoring need not be conducted for construction activities in areas where the ground has been previously disturbed or when construction activities would encounter artificial fill, Young Bay Mud, marsh deposits, or non-sedimentary rocks of the Franciscan Complex. Further, implementation of the approved plan for monitoring, recovery, identification, and curation under Mitigation Measures M-CR-1a: Archaeological Testing, Monitoring, Data Recovery and Reporting, and M-CR-1b: Interpretation, in Section 4.D, Cultural Resources, pp. 4.D.25-4.D.30, would ensure that the scientific significance of the resource under CRHR Criterion 4 (Information Potential) would be preserved and/or realized.

Mitigation Measure M-GE-6: Paleontological Resources Monitoring and Mitigation Program

Prior to issuance of a building permit for construction activities that would disturb sedimentary rocks of the Franciscan Complex (based on the site-specific geotechnical investigation or other available information), the project sponsors shall retain the services of a qualified paleontological consultant having expertise in California paleontology to design and implement a Paleontological Resources Monitoring and Mitigation Program (PRMMP). The PRMMP shall specify the timing and specific locations where construction monitoring would be required; emergency discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; preconstruction coordination procedures; and procedures for reporting the results of the monitoring program. The PRMMP shall be consistent with the Society for Vertebrate Paleontology (SVP) Standard Guidelines for the

mitigation of construction-related adverse impacts to paleontological resources and the requirements of the designated repository for any fossils collected.

During construction, earth-moving activities that have the potential to disturb previously undisturbed native sediment or sedimentary rocks shall be monitored by a qualified paleontological consultant having expertise in California paleontology. Monitoring need not be conducted for construction activities in areas where the ground has been previously disturbed or when construction activities would encounter artificial fill, Young Bay Mud, marsh deposits, or non-sedimentary rocks of the Franciscan Complex.

If a paleontological resource is discovered, construction activities in an appropriate buffer around the discovery site shall be suspended for a maximum of 4 weeks. At the direction of the Environmental Review Officer (ERO), the suspension of construction can be extended beyond 4 weeks if needed to implement appropriate measures in accordance with the PRMMP, but only if such a suspension is the only feasible means to prevent an adverse impact on the paleontological resource.

The paleontological consultant's work shall be conducted at the direction of the City's ERO. Plans and reports prepared by the consultant shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO.

Cumulative Impacts

Although the entire Bay Area is located within a seismically active region with a high risk of seismic hazards and a wide variety of geologic conditions, the geographic scope of potential geology and soils impacts is restricted to the project area and immediate vicinity because related risks are relatively localized or even site-specific. Therefore, the cumulative analysis for geology and soils impacts uses a list-based approach to analyze the effects of the Proposed Project in combination with past, present, and probable future projects in the immediate vicinity. Similar to the analysis for project impacts, the cumulative impact analysis assumes that construction and operation of other projects in the immediate vicinity also would be completed in compliance with applicable building codes and design standards as well as stormwater permitting requirements. The analysis then considers whether or not there would be a significant, adverse cumulative impact associated with project implementation in combination with past, present, and probable future projects in the immediate vicinity, and, if so, whether or not the Proposed Project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

Impact C-GE-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects, would not substantially contribute to cumulative impacts on geology and soils. (*Less than Significant*)

With regard to seismic hazards, the project area could be subjected to very strong ground shaking, and the project site could experience liquefaction and related effects in the event of an earthquake on a nearby fault. However, as discussed in Impact GE-1, pp. 4.N.22-4.N.26, all of the project buildings would be designed and constructed in accordance with the most current building code

requirements and engineering standards for seismic safety, as would any new construction including any construction activities in the adjacent Historic Core. This would minimize the potential for damage.

Regarding erosion, all of the cumulative projects would be required to implement the requirements of Article 4.1 of the San Francisco Public Works Code or the Construction General Stormwater Permit (discussed in more detail in Section 4.O, Hydrology and Water Quality) to reduce the impact of erosion from the construction sites, as discussed in Impact GE-2, p. 4.N.26.

Buildings in the adjacent Historic Core could be damaged by rock fall from the Irish Hill remnant, which would be a significant cumulative impact. However, the Proposed Project's contribution would not be cumulatively considerable because Mitigation Measure M-GE-3a, p. 4.N.31, would require implementation of active controls or setbacks to reduce rock fall hazards, as discussed in Impact GE-3, pp. 4.N.27-4.N.32. Visitors and occupants of the Historic Core also could be endangered if they used the dilapidated pier, discussed in Impact GE-3, a significant cumulative impact. However, the Proposed Project's contribution would not be cumulatively considerable because, as discussed in Impact GE-3, implementation of Mitigation Measure M-GE-3b, pp. 4.N.31-4.N.32, would prevent access to the pier. As discussed in Impact GE-3, implementation of the recommendations of the geotechnical reports for each project would ensure that construction and operation of the cumulative projects and the Proposed Project would not result in other impacts associated with unstable soils or geologic units.

The Proposed Project would not contribute to cumulative impacts related to expansive soil because the project site is not located on expansive soil. Similar to the Proposed Project, all of the potentially cumulative projects would be required to comply with San Francisco and Port of San Francisco Building Code requirements regarding corrosive soil, as discussed in Impact GE-4, p. 4.N.32. None of the potentially cumulative projects would alter the remnant of Irish Hill, so there would be no cumulative impact related to alteration of topography or effects on unique geologic or physical features. With implementation of Mitigation Measure M-GE-6, pp. 4.N.33-4.N.34, the Proposed Project would not contribute to significant cumulative impacts related to the alteration of a unique paleontological resource or site.

For the reasons described above, cumulative impacts related to seismic effects, erosion, unstable soils and geologic units, problematic soils, alteration of topography and effects on unique geologic features, and alteration of a unique paleontological resource or site would be less than significant or the Proposed Project's contribution to the cumulative impact would be less than significant with mitigation specified in this EIR. No additional mitigation is necessary.

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O. HYDROLOGY AND WATER QUALITY

Section 4.O, Hydrology and Water Quality, addresses the hydrology and water quality impacts that could result from construction and operation of the proposed Pier 70 Mixed-Use District Project. The Environmental Setting discussion describes the existing hydrology and water quality in the project area, with a focus on San Francisco Bay and the San Francisco waterfront area. Stormwater management in San Francisco and potential areas of flooding and tsunami inundation are also identified. The Environmental Setting section is followed by a discussion of the Federal, State, and local regulatory framework applicable to construction and implementation of the Proposed Project. Potential impacts that could result from construction and implementation of the Proposed Project are then discussed, along with regulatory requirements and features included in the Proposed Project that would ensure water quality impacts would be less than significant. Mitigation measures that would reduce significant impacts to a less-than-significant level are identified.

The impact assessment includes an evaluation of water quality issues related to on-land construction activities as well as in-bay activities for repair or replacement of the existing bulkhead and construction of a new stormwater outfall. Impacts related to changes in flows to the City's combined sewer system and the new separate stormwater system that could be constructed under the Proposed Project are discussed. This is followed by a discussion of potential impacts related to flooding and tsunami inundation.

Existing conditions and potential impacts associated with water supply and wastewater treatment are addressed in Section 4.K, Utilities and Service Systems. Existing conditions and potential impacts associated with water quality impacts on fish and other marine species are addressed in Section 4.M, Biological Resources.

ENVIRONMENTAL SETTING

CLIMATE

The Bay Area has a Mediterranean climate, with cool, dry summers and mild, wet winters. The mean annual precipitation in San Francisco is approximately 24 inches per year with most of the rainfall occurring between November and March.[1] The average annual temperature in San Francisco is 57.3 degrees Fahrenheit, with the minimum average monthly temperature occurring in December and January (46 degrees Fahrenheit) and maximum average monthly temperature occurring during September (70 degrees Fahrenheit).

[1] U.S. Climate Data, San Francisco. Available online at http://www.usclimatedata.com/climate/san-francisco/california/united-states/usca0987. Accessed March 18, 2016.

SAN FRANCISCO BAY

The project site is adjacent to San Francisco Bay, which connects the Pacific Ocean to the west with San Pablo Bay, Suisun Bay, and the Sacramento-San Joaquin Delta to the north and east. The San Francisco Bay is an estuarine environment that receives saltwater inputs from the Pacific Ocean through the Golden Gate, and freshwater inputs from the Sacramento-San Joaquin Delta to the northeast, as well as various other tributary rivers and creeks located around San Francisco Bay.

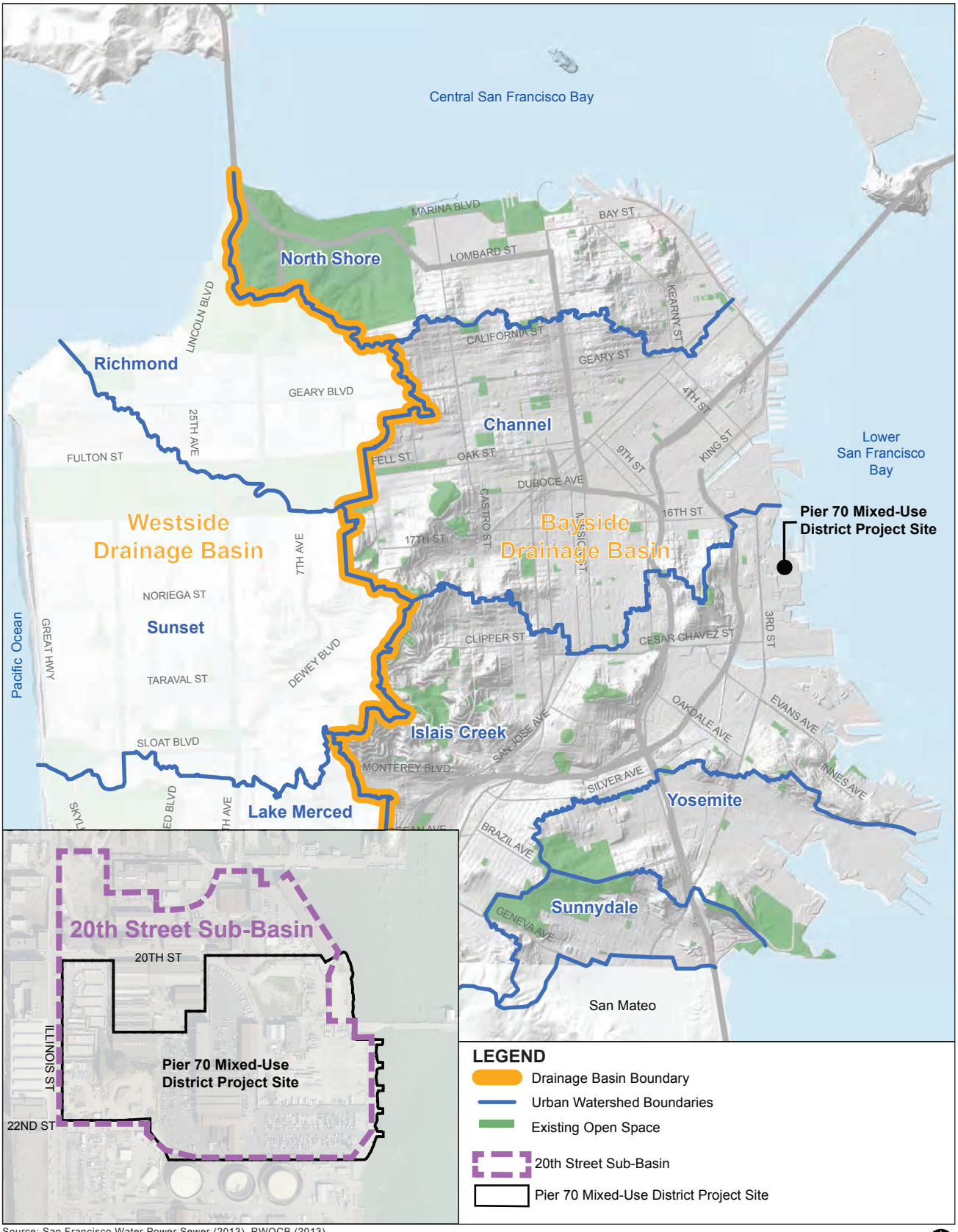
STORMWATER MANAGEMENT

Freshwater flow to San Francisco Bay from San Francisco, including most surface water and stormwater runoff, has been almost entirely diverted to the City's combined sewer system that is operated by the San Francisco Public Utilities Commission (SFPUC). This combined sewer system collects and transports both industrial wastewater and sanitary sewage (collectively referred to as wastewater) and stormwater runoff in the same set of pipes and the combined flows are all treated at the same treatment facilities. However, for portions of the waterfront, the Port of San Francisco (Port) manages separate stormwater systems that discharge stormwater directly to San Francisco Bay. Both the City's combined sewer system and the Port's separate stormwater systems are described below.

All stormwater and wastewater flows from the project site are currently discharged to the City's combined sewer system, discussed below, as are all wastewater flows from the project site. Wastewater flows to the system are discussed below in the context of their contribution to combined sewer discharges during wet weather. Wastewater flows are also discussed in Section 4.K, Utilities and Service Systems, in the context of the potential to exceed the capacity of the City's combined sewer system, including conveyance and treatment facilities.

SFPUC Combined Sewer System

The City's combined sewer system is roughly divided into two major drainages: the Bayside and the Westside drainage basins. The Bayside drainage basin, which includes the project site, covers the eastern side of San Francisco and consists of three distinct regulatory receiving water combined sewer discharge basins and their associated urban watersheds: North Shore (North Shore watershed), Central (Channel watershed in its entirety and a portion of the Islais Creek watershed), and South (remainder of the Islais Creek watershed and the entirety of Yosemite and Sunnydale watersheds). The watersheds are shown on Figure 4.O.1: Bayside Drainage Basin Urban Watersheds. Combined stormwater and wastewater flows from the Bayside drainage basin are conveyed for treatment to the Southeast Water Pollution Control Plant (SEWPCP), located on Phelps Street between Jerrold and Evans avenues.



Source: San Francisco Water Power Sewer (2013), RWQCB (2013)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.O.1: BAYSIDE DRAINAGE BASIN URBAN WATERSHEDS

The SEWPCP includes facilities to provide both primary and secondary treatment of the combined wastewater and stormwater flows. Primary treatment is the first stage in treatment and includes physical methods to remove floating and settleable solids from raw flows. Secondary treatment at the SEWPCP involves aeration with oxygen to enhance the biological breakdown of the combined flows, followed by secondary clarification for further solids removal. All discharges from the SEWPCP, whether treated to a primary or secondary level, are disinfected using sodium hypochlorite and dechlorinated with sodium bisulfite to remove any chlorine residual prior to discharge.

During dry weather (typically May through September), the wastewater flows consist mainly of industrial wastewater and sanitary sewage (wastewater from toilet flushing and other wastewater from sanitary conveniences of households and businesses that contains human excrement), collectively referred to as wastewater. The annual average wastewater flow during dry weather is 60 million gallons per day (mgd).[2] The average dry-weather design flow capacity of the SEWPCP is 84.5 mgd; therefore, the existing dry-weather flows are about 71 percent of the treatment capacity, and all dry-weather wastewater flow is treated to a secondary level at the SEWPCP. During dry weather, the treated wastewater is discharged to San Francisco Bay through the deep water outfall at Pier 80, located immediately to the north of the Islais Creek Channel.

During wet weather (generally October through April), the combined sewer system collects large volumes of stormwater runoff in addition to wastewater, referred to as wet-weather flows. Depending on the amount of rainfall, wet-weather flows are treated to varying levels before being discharged to San Francisco Bay. Up to 150 mgd of wet-weather flows receive secondary treatment at the SEWPCP. The SEWPCP can also treat up to an additional 100 mgd to a primary treatment standard plus disinfection, for a total wet-weather treatment capacity of 250 mgd. Treated wet-weather discharges of up to 250 mgd from the SEWPCP occur through the Pier 80 outfall directly to San Francisco Bay or through the Quint Street outfall to Islais Creek Channel on the south bank of Islais Creek. Only wastewater treated to a secondary level is discharged at the Quint Street outfall.

Up to an additional 150 mgd of wet-weather flows receive primary treatment plus disinfection at the North Point Wet Weather Facility, located on the northern side of the City at 111 Bay Street. This facility operates only during wet weather. The treatment process at this facility consists of using bar screens to remove large objects such as garbage; sedimentation to allow solids to settle out; skimming to remove floatables; disinfection with sodium hypochlorite; and dechlorination using sodium bisulfite to remove any chlorine residual before discharge. Primary treated effluent from this facility is discharged through four deep water outfalls, approximately 800 feet from San

[2] San Francisco Water Power Sewer, San Francisco's Wastewater Treatment Facilities, June 2014.

Francisco Bay shore and 18 feet below mean lower low water. Two of the deep water outfalls terminate at the end of Pier 33, and two terminate at the end of Pier 35 on the northeastern San Francisco Bay shore.

The City's combined sewer system includes underground concrete storage and transport boxes that, during wet weather, temporarily retain the combined stormwater and wastewater flows that exceed the total 400-mgd capacity of the SEWPCP and the North Point Wet Weather Facility for later treatment. When rainfall intensity results in combined flows that exceed the total 400-mgd capacity of the SEWPCP and North Point Wet Weather Facility, and the 125-million-gallon capacity of the storage and transport structures, the excess flows are discharged through 29 combined sewer discharge (CSD) structures located along the City's bayside waterfront from the Marina Green to Candlestick Point. Discharges from these structures receive "flow-through treatment," which is equivalent to primary treatment, to remove settleable solids and floatable materials. Wet-weather flows are intermittent throughout the rainy season, and combined sewer discharge events vary in nature and duration, depending largely on the intensity of individual rainstorms.

All discharges from the City's combined sewer system to San Francisco Bay, through either the outfalls or the CSD structures, are operated in compliance with the Federal Clean Water Act (CWA) and the State Porter-Cologne Water Quality Control Act through the National Pollutant Discharge Elimination System (NPDES) permit for discharges from the "Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities, and Wastewater Collection System" (referred to as the Bayside NPDES Permit).

The SFPUC Wastewater Enterprise manages the City's combined sewer collection, treatment, and discharge system, and is currently implementing the Sewer System Improvement Program, a City-wide program to repair and seismically upgrade aging sewer infrastructure. Prepared with extensive input from the public, the Sewer System Improvement Program focuses on providing reliable, efficient, sustainable, and environmentally acceptable operation and management of the combined sewer system and addresses both critical near-term needs and long-term issues. The plan incorporates adaptations for climate change.

20th Street Sub-Basin

The Proposed Project is entirely located within the 20th Street sub-basin of the Islais Creek watershed of the combined sewer system as shown on Figure 4.O.1, p. 4.O.3. This basin is approximately bounded by Illinois Street on the west, 19th Street on the north, 22nd Street and the Potrero Power Plant on the south, and San Francisco Bay on the east. This sub-basin includes the project site (both the 28-Acre Site and the Illinois Parcels), 20th Street Historic Core site, and the BAE Systems Ship Repair facility between 19th and 20th streets. Within this sub-basin, a 54-inch-

diameter sewer line collects stormwater and wastewater flows from the eastern portion of the project site and a 42-inch-diameter sewer line collects stormwater and wastewater flows from areas near Michigan Street and the northern portion of the project site. These combined sewer lines convey flows to the 20th Street Pump Station near the northeast corner of the project site. The 20th Street Pump Station pumps the flows through a 10-inch-diameter force main located beneath 20th Street to a 27-inch-diameter gravity sewer main under Illinois Street. From there, the combined stormwater and wastewater flows are conveyed to the SEWPCP for treatment prior to discharge to San Francisco Bay in accordance with the Bayside NPDES Permit.

The 20th Street Pump Station was built in 1993 and was designed with a capacity of 3.0 mgd.[3] However, volumetric testing conducted by the SFPUC in July 2013 indicates that the pump station capacity is about 2.65 mgd with both pumps running.[4] Based on 24 hours of flow monitoring conducted in August 2013 by the SFPUC during a period of no rainfall, the average wastewater flow rate to the pump station was 0.75 mgd and the peak flow rate was 1.5 mgd.[5] Based on this, the SFPUC estimated that the pump station has a remaining dry-weather capacity of about 1.2 mgd.

When the capacity of the 20th Street Pump Station is exceeded during wet weather, a portion of the excess wet-weather flows is stored in the 54- and 42-inch-diameter sewer lines. Flows in excess of the pump station and sewer line storage capacity are discharged to the Central Basin of San Francisco Bay via the 20th and 22nd streets CSD structures located along the shoreline of the project site.[6] Consistent with other discharges from CSD structures, these discharges receive the equivalent of primary treatment to remove settleable solids and floatable materials prior to discharge.

The 20th Street sub-basin collection and conveyance facilities are designed to meet a long-term average of no more than 10 CSDs per year.[7] Although the system was designed and constructed based on meeting this long-term average, it is understood that some years are wetter than others. Therefore, the Bayside NPDES Permit allows for the 10-CSD discharge annual average to be

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3 San Francisco Public Utilities Commission (SFPUC), *Bayside Drainage Basin Urban Watershed Characterization, Final Draft Technical Memorandum*, July 2013 (hereinafter referred to as *Bayside Drainage Basin Technical Memorandum*), p. 3-21.

4 SFPUC, *20th Street Pump Station Volumetric Discharge Test and Contributing Flows, Technical Memorandum*, August 30, 2013 (hereinafter referred to as *20th Street Pump Station Technical Memorandum)*, p. 5.

5 SFPUC, *20th Street Pump Station Technical Memorandum*, p. 3.

6 San Francisco Bay Regional Water Quality Control Board, Order No. R2-2013-0029, NPDES No. CA0037664, Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities, and Wastewater Collection System, August 19, 2013, p. 24.

7 SFPUC, *Task 500, Technical Memorandum No. 509, Combined Sewer Discharges, Final Draft.* December 2010, p. 3.

exceeded in any particular year as long as the long-term average is maintained at the appropriate level.

The weirs for the 20th and 22nd streets CSD structures are at elevations of 8.3 and 8.6 feet NAVD88[8] (96.9 and 97.2 feet project datum[9]), respectively, and the SFPUC estimates that they could become flooded as sea levels rise.[10] The flooding could potentially reduce the storage capacity of the 20th Street sub-basin collection and conveyance facilities, and also introduce sea water into the combined sewer system.[11] The SFPUC recommends installation of tideflex gates in these CSD structures to minimize the backflow of saline water into the sewer system as sea levels rise. The SFPUC will complete an assessment of the CSD structures as part of the City's Sewer System Improvement Program.

Port Stormwater Management

The Port of San Francisco manages approximately 7.5 miles of San Francisco's waterfront from Hyde Street Pier on the north to India Basin on the south.[12] The vast majority of this area is served by separate storm drain systems operated by the Port that drain directly to San Francisco Bay. In other areas of the waterfront, there is no storm drain system and stormwater infiltrates into the ground or runs off to San Francisco Bay. All of these areas are classified as municipal separate stormwater systems (or MS4s) by the State Water Resources Control Board (SWRCB). Accordingly, stormwater discharges from these areas are regulated under the SWRCB Water Quality Order No. 2013-0001-DWQ, NPDES General Permit for Waste Discharge Requirements (WDRs) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The Port does not currently maintain a separate storm drain system at the project site.

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[8] North American Vertical Datum of 1988 (NAVD88) is a fixed reference point (vertical elevation) adopted as the official, civilian, vertical datum for elevations determined by Federal surveying. Historically, the average (mean) sea level or some variation of sea level has served as a reference point for elevations. One problem with using sea level is that it changes. In addition, the earth is not spherical, but has an ellipsoid shape, and has local variations due to uplift and sinking of portions of the earth's crust. Therefore, sea level in relation to the earth's crust varies. A vertical datum system not based on sea level avoids these problems. NAVD88 is based on a point in Quebec, Canada. Sources: U.S. Geologic Survey, http://water.usgs.gov/ADR_Defs_2005.pdf, pp. 8-9, accessed June 22, 2015.

[9] San Francisco City Datum establishes the City's zero point for surveying purposes at approximately 11.4 feet above the 1988 North American Vertical Datum. The project sponsors have also established a project datum for project-specific purposes that is equal to San Francisco City Datum plus 100 feet. This is 88.6 feet higher than NAVD88.

[10] SFPUC, *Bayside Drainage Basin Technical Memorandum*, p. 1-25.

[11] SFPUC, *Bayside Drainage Basin Technical Memorandum*, p. 3.22-3.24.

[12] Port of San Francisco, *Storm Water Management Plan 2003-2004*, December 2003.

EXISTING FLOOD ZONES

Some low-lying areas along San Francisco's Bay shoreline are subject to flooding during periods of extreme high tides, storm surge, and waves, although these occurrences are relatively rare in San Francisco compared to areas prone to hurricanes or other major coastal storms or to developed areas near or below sea level. In 2008, the City and County of San Francisco adopted interim flood maps depicting the 100-year flood hazard zone along the City's Bay shoreline. The shoreline portions of the project site are located within a currently identified 100-year flood hazard zone based on the City's interim floodplain maps.[13] Flooding in these areas would have the potential to damage buildings and infrastructure, and structures built in these areas could potentially impede or redirect flood flows.

FLOODING AS A RESULT OF SEA LEVEL RISE

Flooding conditions at the project site and along San Francisco's Bay shoreline would be exacerbated with projected sea level rise over the remainder of the century due to climate change. This section discusses the factors contributing to coastal flooding and the potential for increased flooding in the future as a result of sea level rise, assuming that no flood protection measures are implemented.

Factors Contributing to Coastal Flooding

Coastal areas are vulnerable to periodic flooding due to extreme tides, storm surge, storm waves, and El Niño storm events. These conditions can result in many effects including severe flooding of low-lying areas, including roads, boardwalks, and waterfront promenades; storm drain backup; wave damage to coastal structures; and erosion of natural shorelines. Rising sea level due to climate change has the potential to increase the frequency, severity, and extent of flooding as a result of these conditions, each of which is described below.

Extreme Tides

Diurnal (twice daily) high tides along San Francisco's Bay shoreline typically range from approximately 5 to 7 feet NAVD88 (94 to 96 feet project datum), and annual maximum tides may exceed 7 feet NAVD88 (96 feet project datum).[14] The twice yearly extreme high and low tides are called "king tides." These occur each year during the winter and summer when the earth, moon, and sun are aligned, and the winter event may be amplified by weather. A portion of the

[13] City and County of San Francisco, San Francisco Interim Floodplain Map, East, Final Draft, July 8, 2008.

[14] SFPUC, *Climate Stressors and Impact: Bayside Sea Level Rise Mapping, Final Technical Memorandum.* June 2014 (hereinafter *Bayside Sea Level Rise Mapping Technical Memorandum*), p. 10.

Embarcadero Promenade near Pier 14 and the Marina area in San Francisco experience inundation under king tide conditions.[15]

Storm Surge

Storm surge occurs when persistent high winds and changes in air pressure elevate bay water levels above normal tide levels, which can raise the water level near the shoreline by several feet and may persist for several days. Along San Francisco's Bay shoreline, storm surge typically raises the surface water elevation by 0.5 foot to as much as 3.0 feet during major winter storms.[16] The degree of storm surge depends on the severity of the storm as well as tidal levels at the time of the storm. Storm surge is characterized using a return period that represents the expected frequency of a storm event occurring based on historical information. One-year storm surge is expected to occur each year while 100-year storm surge (which represents more extreme conditions) has a 1 percent chance of occurring in any year.

Storm Waves

Waves and wave run-up primarily affect a narrow band along the shoreline where wave energy can damage structures and overtop both natural embankments and shoreline protection structures such as seawalls and levees. The influence of waves diminishes inland as wave energy dissipates. In addition, the Pacific Ocean waves, which are generally larger than those originating in San Francisco Bay, are substantially dampened along San Francisco Bay shoreline due to transformation processes within San Francisco Bay. Along the San Francisco Bay shoreline, storm waves typically raise the surface water elevation by 1 to 4 feet during major winter storms several times a year.[17]

El Niño Winter Storms

During El Niño events,[18] atmospheric and oceanographic conditions in the Pacific Ocean bring warm, higher waters to the Bay Area and may produce severe winter conditions that bring intense rainfall and storm conditions to the Bay Area. Tides are often elevated 0.5 to 1.0 foot above normal along the coast and in San Francisco Bay for months at a time, and additional storm surge

[15] SFPUC, *Bayside Sea Level Rise Mapping Technical Memorandum*, p. 7.
[16] SFPUC, *Bayside Sea Level Rise Mapping Technical Memorandum*, p. 10.
[17] SFPUC, *Bayside Sea Level Rise Mapping Technical Memorandum*, p. 10.
[18] El Niño–Southern Oscillation (ENSO) is a natural oceanic-atmospheric cycle. El Niño conditions are defined by prolonged warming in the Pacific Ocean sea surface temperatures. Typically, this happens at irregular intervals of 2 to 7 years, and can last anywhere from 9 months to 2 years.

and wind effects during storm events can elevate water levels even further. El Niño conditions prevailed in 1977-1978, 1982-1983, 1997-1998, 2009-2010,[19] and 2015-2016.[20]

Sea Level Rise

Sea levels are rising globally due to climate change, and they are expected to continue to rise at an accelerating rate for the foreseeable future. The sea level at the San Francisco tidal gage has risen approximately 0.8 inch per year since 1897, resulting in about 0.6 foot of sea level rise between that time and 2015.[21] The National Research Council's (NRC) 2012 report, *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (the NRC Report) provides a scientific review of sea level rise for the West Coast and provides the most recent regional sea level rise predictions for 2030, 2050, and 2100, relative to the year 2000 sea level.[22] In this report, the NRC projects that sea levels in the Bay Area will rise 11 inches by 2050 and 36 inches by 2100, as presented in Table 4.O.1: Sea Level Rise Estimates for San Francisco Bay Relative to the Year 2000. As presented in the NRC Report, these sea level rise projections represent likely sea level rise values based on the current understanding of global climate change and assuming a moderate level of greenhouse gas (GHG) emissions[23] and extrapolation of continued accelerating land ice melt patterns.

The NRC Report also includes ranges of sea level rise that could occur based on different estimates of GHG emissions and ice melt patterns. The extreme upper limit of the ranges represents unlikely but possible levels of sea level rise that are based on very high GHG emissions scenarios and significant ice melt that is not currently anticipated but could occur. Assuming the maximum level of GHG emissions and ice melt, the NRC anticipates that sea levels

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[19] SFPUC, *Bayside Sea Level Rise Mapping Technical Memorandum*, p. 8.

[20] National Oceanic and Atmospheric Administration (NOAA), Climat.gov, El Nino and La Nina (El-Nino-Southern Oscillation. Available online at https://www.climate.gov/enso. Accessed June 13, 2016.

[21] NOAA, Mean Sea Level Trend 9414290 San Francisco, California. Available online at https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=9414290. Accessed June 22, 2016.

[22] National Research Council, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. Washington, DC: The National Academies Press, 2012. Available online at http://www.nap.edu/catalog.php?record_id=13389. Accessed November 28, 2015.

[23] Future emissions of greenhouse gases depend on a collection of human decisions at local, regional, national, and international levels as well as potential unknown technological developments. For this reason, future changes in greenhouse gas emissions cannot be accurately estimated, and a range of emissions levels is considered in the NRC Report. Estimates of sea level rise relative to thermal expansion of the oceans were formulated using the mid-level, or moderate level, of predicted changes in greenhouse gas emissions (from a combination of fossil and non-fossil fuels), as well as an assumption of high economic growth; this represents scenario "A1B" as described by the Intergovernmental Panel on Climate Change (IPCC).

in the Bay Area could rise up to 24 inches by 2050 and 66 inches by 2100 as presented in Table 4.O.1.

Table 4.O.1: Sea Level Rise Estimates for San Francisco Bay Relative to the Year 2000

Year	Projection (inches)	Upper Range (inches)
2030	6	12
2050	11	24
2100	36	66

Source: National Research Council, 2012

These estimates represent the long-term increase in Mean Sea Level and the associated average daily high tide conditions (represented by Mean Higher High Water, or MHHW)[24] that could result from sea level rise; they do not take into account extreme tides, storm surge, storm waves, or El Niño storm events, all of which can result in water levels that are temporarily higher than MHHW as discussed above.

In March 2013, the California Ocean Protection Council updated its 2010 Statewide sea level rise guidance to adopt the NRC Report as the current, best available science on sea level rise for California.[25] The California Coastal Commission supports the use of the NRC Report as the best science currently available in its *Sea Level Rise Policy Guidance*, which it adopted in 2015. The California Coastal Commission guidance emphasizes the importance of regularly updating sea level rise projections as the science continues to advance.[26] The San Francisco Bay Conservation and Development Commission (BCDC) also considers the NRC Report to be the best available science-based prediction of sea level rise for San Francisco Bay. Accordingly, the Planning Department considers the NRC Report to be the best science currently available on sea level rise affecting San Francisco for both CEQA and planning purposes.

[24] Mean Higher High Water is the higher of each day's two high tides averaged over time.

[25] *State of California Sea-Level Rise Guidance Document.* Developed by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. March 2013 Update (hereinafter "*State of California Sea-Level Rise Guidance Document*"). Available online at http://www.opc.ca.gov/webmaster/ftp/pdf/docs/2013_SLR_Guidance_Update_FINAL1.pdf. Accessed November 28, 2015.

[26] California Coastal Commission, *Sea Level Rise Policy Guidance, Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits, Unanimously Adopted August 12, 2015.* Available online at http://documents.coastal.ca.gov/assets/slr/guidance/August2015/0_Full_Adopted_Sea_Level_Rise_Policy_Guidance.pdf. Accessed November 28, 2015.

Although the NRC Report provides the best available sea level rise projections for San Francisco Bay at this time, scientific uncertainty remains regarding the rate and magnitude of sea level rise. Sea level rise projections beyond 2050 are highly dependent on assumptions regarding future global GHG emissions and future changes in the rate of land ice melting. As a result of the uncertainties inherent in these assumptions, the range of sea level rise predictions becomes substantially broader beyond 2050. In recognition of this uncertainty, the State of California Sea-Level Rise Guidance recommends an adaptive management approach for development in areas that may be subject to sea level rise beyond 2050.[27] Adaptive management is an iterative process that involves monitoring conditions to evaluate whether an area could be inundated as a result of sea level rise, and identifying future actions to be implemented to ensure that the area and existing structures are resilient to future flooding conditions.

SEA LEVEL RISE INUNDATION MAPPING

The SFPUC, as part of the planning for its Sewer System Improvement Program, developed a series of maps published in 2014 that represent areas of inundation along both San Francisco Bay and Pacific Ocean shorelines of San Francisco. These maps use a 1-meter horizontal grid resolution[28] based on the 2010/2011 California Coastal Mapping Program LiDAR. The inundation maps use data from the Federal Emergency Management Agency's (FEMA) California Coastal Mapping and Analysis Project, which includes detailed coastal engineering analyses and mapping of the San Francisco Bay shoreline.

The SFPUC inundation maps evaluate scenarios that represent the NRC projections of sea level rise in combination with the effects of storm surge. They represent permanent inundation that could occur as a result of total water level rises (over and above year 2000 MHHW) based on daily tidal fluctuations. Each scenario also addresses temporary inundation that could occur from extreme tides and from 1-year, 2-year, 5-year, 25-year, 50-year, and 100-year storm surge. Flooding as a result of storm surge would occur on a temporary basis, during and immediately after a storm event or extreme tide.

The scenarios listed below are representative of San Francisco Bay water elevations that could occur by the year 2050 and the year 2100, based on the NRC's projected levels of sea level rise and considering a 100-year storm surge.

- 12 inches above year 2000 MHHW (representative of NRC's projected sea level rise by 2050);

[27] *State of California Sea-Level Rise Guidance Document*; p. 3.

[28] The horizontal grid resolution of a digital elevation model (DEM) defines the scale of the features that are modeled; this is generally the minimum resolution necessary to depict levees, berms, and other topographic features important to diverting floodwaters.

- 36 inches above year 2000 MHHW (representative of NRC's projected sea level rise by 2100);
- 52 inches above year 2000 MHHW (representative of NRC's projected sea level rise by the year 2050 in combination with a 100-year storm surge); and
- 77 inches above year 2000 MHHW (representative of NRC's projected sea level rise by the year 2100 in combination with a 100-year storm surge).

The following scenarios are representative of the maximum San Francisco Bay water elevations that could occur by the year 2100, based on the NRC's upper range of sea level rise and considering 100-year storm surge.

- 66 inches above year 2000 MHHW (representative of NRC's upper range of sea level rise by 2100); and
- 107 inches above year 2000 MHHW (representative of NRC's upper range of sea level rise by the year 2100 in combination with a 100-year storm surge).

The SFPUC cautions that its maps represent a "do nothing" scenario, in which no site-specific measures are taken to prevent future flooding and no area-wide measures such as waterfront protection structures are constructed. In the event that the City undertakes area-wide measures to protect against inundation in the future, the mapping would need to be revised to reflect the modified inundation areas with implementation of these measures. In addition, because the SFPUC sea level rise maps are based on 2010/2011 topographic mapping, they do not account for planned increases in the base elevation of the project site as would occur with implementation of the Proposed Project to prevent future flooding due to sea level rise.

MHHW near the project site is at an elevation of 6 feet NAVD88 (95 feet project datum).[29] Table 4.O.2: Water Elevations Associated with Sea Level Rise Projections, presents water elevations near the project site associated with each of the sea level rise scenarios discussed above, based on the existing MHHW elevation. In Table 4.O.2, elevations are presented in NAVD88, which is a datum commonly used throughout the nation. The elevations are also provided in the project datum that was established by the project sponsors for project-specific purposes. The project datum is 88.6 feet higher than NAVD88.

The SFPUC inundation maps indicate that under existing conditions, only the immediate waterfront portion of the project site would be inundated with 12 inches of sea level rise, which is expected by 2050, even when the effects of 100-year storm surge are considered. Similarly, the site would not be subject to daily tidal inundation with 36 inches of sea level rise, except for the immediate waterfront. However, when the effects of 100-year storm surge are considered in addition to 36 inches of sea level rise, the flood level would be approximately 13 feet NAVD88

[29] SFPUC, *Bayside Sea Level Rise Mapping Technical Memorandum.*

(101 feet project datum). Over half of the 28-Acre Site could be temporarily flooded to a maximum depth of 2 feet with the current site grade. Under this scenario, flooding would occur in the eastern portion of the site and extend westward, just beyond the proposed Maryland Street. Similarly, the eastern portion of the 28-Acre Site would be inundated with 66 inches of sea level rise, and when the effects of 100-year storm surge are considered, the flood level would be approximately 15 feet NAVD88 (104 feet project datum). The entire 28-Acre Site could be temporarily flooded to a maximum depth of 5 feet with the current site grade. The Illinois Parcels sit at a higher surface elevation and no part of the Illinois Parcels is within an anticipated future flood zone.

Table 4.O.2: Water Elevations Associated with Sea Level Rise Projections

Sea Level Rise Scenario	Elevation (feet, NAVD88)	Elevation (feet, Project Datum[1])
2000 MHHW with no sea level rise	6	95
2000 MHHW plus 100-year storm surge	10	98
2000 MHHW plus 12 inches of sea level rise	7	96
2000 MHHW plus 12 inches of sea level rise and 100-year storm surge	11	99
2000 MHHW plus 36 inches of sea level rise	9	98
2000 MHHW plus 36 inches of sea level rise and 100-year storm surge	13	101
2000 MHHW plus 66 inches of sea level rise (upper range)	12	100
2000 MHHW plus 66 inches of sea level rise and 100-year storm surge (upper range)	15	104

Notes:

MHHW – Mean Higher High Water. This is the higher of each day's two high tides averaged over time.

[1] San Francisco City Datum establishes the City's zero point for surveying purposes at approximately 11.4 feet above the 1988 North American Vertical Datum. The project datum is equal to San Francisco City Datum plus 100 feet. This is 88.6 feet higher than NAVD88.

Sources: San Francisco Water, Power, Sewer, 2014; Orion Environmental Associates, 2015

PLANNING FOR SEA LEVEL RISE IN SAN FRANCISCO

The City has convened an inter-agency Climate Adaptation Working Group to identify ways to make sure that it is prepared to adapt to effects of sea level rise.[30] Participating agencies include the Department of the Environment, the SFPUC, the Planning Department, the City Administrator's Office, the Port, San Francisco International Airport (SFO), San Francisco Public

[30] San Francisco Department of the Environment. *Adaptation.* Available online at http://www.sfenvironment.org/article/climate-change/adaptation. Accessed March 4, 2016.

Works (SFPW), the San Francisco Municipal Transportation Agency (SFMTA), the Department of Public Health (DPH), and the Department of Recreation and Parks. The working group is focusing its effort on the City's most imminent adaptation concerns, including sea level rise along Ocean Beach and shores, flooding from storm surge and extreme rain events, an increased likelihood of extreme heat, and decreased fog that supports local ecosystems such as redwoods. It is working on ways to improve the existing coastal flood protection infrastructure in time to prevent significant flooding impacts from sea level rise. The working group will establish requirements addressing proper flood insurance for structures in low-lying areas, flood-resilient construction of new development within inundation areas, and a low carbon footprint for new development. It is also assessing the use of natural solutions, such as wetlands, to protect the shoreline.

San Francisco Mayor Edwin M. Lee also established two interdepartmental committees to manage the City's efforts on addressing sea level rise: the Sea Level Rise (SLR) Coordinating and SLR Technical committees. The SLR Coordinating Committee, established in February 2015, is a director-level committee co-chaired by the Director of Citywide Planning at the Planning Department and the City Engineer and Deputy Director at SFPW. SLR Coordinating Committee members also include the Chief Resiliency Officer and senior staff from the Mayor's Office, the City Administrator's Office, SFO, the Port, the SFPUC, SFMTA, the Department of Building Inspection (DBI), the Office of Community Investment and Infrastructure, the Office of Economic and Workforce Development, and the Capital Planning Committee. The responsibilities of the SLR Coordinating Committee are as follows.

1. Coordinate the efforts of City departments and advise the Mayor's Office on policies, strategies, initiatives, and resolutions to deal with and plan for potential impact on San Francisco from sea level rise;
2. Coordinate local efforts and initiatives with the work of other governmental entities and various stakeholders at the regional, State, and national levels such as the U.S. Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development, the Department of the Interior, the California Coastal Commission, the California Ocean Protection Council, and BCDC;
3. Provide guidance and specific recommendations to City departments with regard to land use and strategies to protect assets and communities along the shoreline;
4. Oversee and guide the existing SLR Technical Committee and implementation of the Capital Planning Guidance to address vulnerability and risks, and adaptability of the City's physical infrastructure; and
5. Promote coordination and collaboration among City departments, private utility providers, and other stakeholders.

The SLR Coordinating Committee is first charged with assessing the City's risk to sea level rise. Once the data analysis phase is complete, the SLR Coordinating Committee will coordinate the

City's SLR vulnerability assessment and adaptation planning efforts with local, regional, and national governmental and non-governmental organizations and with community stakeholders, as needed. Key to this effort will be determining how to best involve the community.

The SLR Technical Committee was established in February 2015 and is comprised of the same membership that developed the Capital Planning Committee's Sea Level Rise Guidance, including the SFPUC, Port, SFPW, SFO, SFMTA, Capital Planning, and the Planning Department. This committee is charged with assisting all City agencies with consistent implementation of the Guidance, revising the Guidance as needed, and assisting the SLR Coordinating Committee as requested.

Guidance for Incorporating Sea Level Rise into Capital Planning

On September 22, 2014, the City's Capital Planning Committee adopted the Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation, which was prepared by the SLR Coordinating Committee.[31] The guidance document has been revised to simplify the analysis of specific sea level rise scenarios and clarify how to select the appropriate scenario for design and planning purposes. The revised document also provides a methodology for determining the design tide for use in project design and planning, and was adopted by the Capital Planning Committee on December 14, 2015.[32]

San Francisco Sea Level Rise Action Plan

In March 2016, the SLR Coordinating Committee released the San Francisco Sea Level Rise Action Plan, with lead City staffing by the Planning Department and SFPW, along with other City departments and a consultant team.[33] The Action Plan is intended to guide City departments in their understanding of and adaptation to the impacts of sea level rise, and it also identifies what long-term sea level rise means for San Francisco's residents, visitors, economy, and waterfront.

The Action Plan establishes an overarching vision, goals, and a set of guiding principles for sea level rise planning; summarizes current climate science, relevant policies and regulations, and

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[31] City and County of San Francisco Sea Level Rise Committee, *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*, September 14, 2015. Available online at http://onesanfrancisco.org/wp-content/uploads/San%20Francisco%20SLR%20Guidance%20Adopted%209.22.14%2012182014.pdf. Accessed March 15, 2016.

[32] City and County of San Francisco Sea Level Rise Committee, Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation. December 14, 2015. Available online at http://onesanfrancisco.org/wp-content/uploads/Guidance-for-Incorporating-Sea-Level-Rise-into-Capital-Planning1.pdf. Accessed January 22, 2016.

[33] City and County of San Francisco, Sea Level Rise Action Plan, March 2016. Available online at http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309_SLRAP_Final_ED.pdf. Accessed November 28, 2016.

vulnerability and risk assessments conducted to date; identifies data gaps and establishes a framework for further assessment, adaptation planning, and implementation; and provides the foundation and guidance to develop a citywide Sea Level Rise Adaptation Plan.

The Action Plan is the first step in the development of the Citywide Sea Level Rise Adaptation Plan, expected to be complete in 2018, which will incorporate the adaptation strategies identified in the Action Plan and help prioritize investments to best improve climate resilience while protecting economic and environmental value. The Adaptation Plan will also identify potential funding sources, governance structures, and implementation timelines.

Planning for Climate Change under the SFPUC Sewer Improvement Program

The SFPUC is also addressing sea level rise as part of its Sewer System Improvement Program, and is conducting a detailed analysis of the potential for new and existing combined sewer infrastructure to be affected by sea level rise.[34] Accordingly, all new facilities will be built using a climate change criterion so the combined sewer system will be better able to respond to rising sea levels. Rising sea levels and storm surge could potentially inundate the combined sewer system and exacerbate existing flooding that can result from backups of the sewer system in some areas of San Francisco. Rising sea levels and storm surge can also cause new flooding. To address these issues, the SFPUC is also evaluating alternatives such as the installation of backflow preventers on the CSD structures to restrict the intrusion of Bay water into the combined sewer system.

TSUNAMI AND SEICHE

Tsunamis (seismic sea waves) are long-period waves that are typically caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides. Tsunamis, which travel at speeds up to 700 miles per hour, are typically only 1 to 3 feet high in open ocean water but may increase in height to up to 90 feet as they reach coastal areas, potentially causing large amounts of damage when they reach land.[35] Low-lying coastal areas such as tidal flats, marshlands, and former bay margins that have been artificially filled but are still at or near sea level are generally the most susceptible to tsunami inundation.

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[34] SFPUC, *Bayside Drainage Basin Urban Watershed Opportunities, Final Draft Technical Memorandum*, July 2014.

[35] City and County of San Francisco, *Emergency Response Plan, an Element of the CCSF Emergency Management Program, Tsunami Response Annex*, March 2011, p. 21 (hereinafter referred to as *Emergency Response Plan).* Available online at http://www.sfdem.org/ftp/uploadedfiles/DEM/PlansReports/TsunamiAnnex-2008.pdf. Accessed November 28, 2015.

A seiche is caused by oscillation of the surface of an enclosed body of water such as the San Francisco Bay due to an earthquake or large wind event. Seiches can result in long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up.

Fifty-one tsunamis were recorded or observed in San Francisco Bay between 1850 and early 2011.[36] Nine of these tsunamis originated in Alaska and were caused by an earthquake, earthquake and landslide, or volcano and earthquake. The 1906 earthquake generated a 4-inch wave run-up, recorded at the Presidio gage station. In more recent years, it is probable that wave impact occurred in and around the Bay Area resulting from a 1946 earthquake in the Aleutian Islands; a tsunami generated in 1960 that killed 61 people in Hawaii and damaged the West Coast; and a 1964 Alaskan earthquake that generated a tsunami and caused 12 deaths and 17 million dollars in damage in Crescent City. The earthquake that hit Japan in March 2011 initiated a tsunami that resulted in a run-up of 0.5 to 7.8 feet along the California Coast with 2.2 feet of run-up observed at the San Francisco Marina.[37] There are no known recorded deaths from tsunami-related events in San Francisco County.

In 2009, the California Geological Survey, California Emergency Management Agency, and the Tsunami Research Center at the University of California completed the State's official tsunami inundation maps. This mapping indicates that the majority of the 28-Acre Site is located in an area identified for potential inundation in the event of a tsunami or seiche based on existing site grades.[38] The estimated maximum potential tsunami and seiche wave height is approximately 6 feet at the project site, based on emergency response mapping conducted by the City.[39] As stated in a site-specific assessment of tsunami risks at the project site, this worst case wave height

[36] City and County of San Francisco, *Emergency Response Plan*, p. 4.

[37] R. Wilson, L. Dengler, J. Borrero, C. Synaloakis, B. Jaffe, A. Barberopoulou, L. Ewing, M. Legg, A. Rtichie, P. Lynette, A. Admire, T. McCrink, J. Falls, J. Treiman, M. Manson, C. Davenport, J. Lancaster, B. Olson, C. Pridmore, C. Real, K. Miller, J. Goltz, *The Effect of the 2011 Tohoku Tsunami on the California Coastline.* Available online at http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Documents/ssa_2011_california_tohoku_small.pdf. Accessed November 28, 2015.

[38] California Emergency Management Agency, California Geological Survey, University of Southern California, *Tsunami Inundation Map for Emergency Planning, San Francisco North Quadrangle/San Francisco South Quadrangle (San Francisco Bay)*, June 15, 2009. Available online at http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanFrancisco/Documents/Tsunami_Inundation_SouthSFNorthSF_SFBay_SanFrancisco.pdf. Accessed November 28, 2015.

[39] City and County of San Francisco, *Emergency Response Plan*, Attachment B.

includes a 150 percent factor of safety.[40,41] When added to the Mean High Water[42] level of 6 feet NAVD88, the maximum tsunami inundation elevation would be about 12 feet NAVD88 (100 feet project datum).

Tsunami Warning System

The National Oceanic and Atmospheric Administration (NOAA) operates the Pacific Tsunami Warning System with centers located in Hawaii and Alaska. These warning centers are linked to the Advanced National Seismic System that monitors earthquakes in the United States, to international seismic monitoring systems, and to a system of tide gages and buoys. The California Integrated Seismic Network also provides information regarding the magnitude and location of California earthquakes and a quick link to the NOAA/West Coast and Alaska Tsunami Warning Center. Based on the level of threat indicated by these systems, NOAA issues a Tsunami Advisory, Watch, or Warning.

The City and County of San Francisco has prepared a Tsunami Response Annex as part of the City's Emergency Response Plan.[43] In accordance with this annex, the San Francisco Department of Emergency Management (DEM) would determine the appropriate plan of action based on the level of threat. In the event of a Tsunami Advisory or Watch, the DEM would issue a local Emergency Alert Message and evaluate the need to evacuate residents, schools, hotels, and people in the potential inundation zones, as well as the need to close the zoo, wharf, Marina area, and beaches. The DEM would also notify critical City departments and support agencies, and would monitor both the threat status and measured tide levels. If the Tsunami Watch is upgraded to a Tsunami Warning and measured tide levels confirm that the wave has the potential to create significant inundation in San Francisco, the Outdoor Public Warning System would be activated, which includes sirens, a public address system, and broadcasting public safety messages through the local media. The notification would include instructions for walking to higher ground or evacuating and for obtaining basic services such as shelter, food, water, and medical services. The DEM would also coordinate response actions with appropriate local, State, and other emergency response agencies. Once the area is deemed safe for re-entry, an all-clear public safety message would be broadcast.

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[40] Moffatt & Nichol, *Pier 70 Development Project, Tsunami Risk Assessment – DRAFT*, September 25, 2015 (hereinafter referred to as *Tsunami Risk Assessment),* p. 3-4.

[41] Because there are many uncertainties involved in calculating the height of a tsunami wave, such as the height of the originating wave and the attenuation that would occur within San Francisco Bay and along San Francisco Bay shore, it is prudent to include a factor of safety in the estimate. The factor of safety is the amount that the estimated wave height exceeds the calculated wave height. In this case, the estimate is 50 percent higher than the calculated wave height.

[42] Mean High Water is the average of all high water levels observed over a period of several years.

[43] City and County of San Francisco, *Emergency Response Plan*.

The Tsunami Warning System takes an average of 7 to 10 minutes to identify a tsunami threat and communicate it to the media and State warning systems. The initial notification is based on seismic data. A tsunami's travel time is on the order of minutes (for local events) to hours (for distant events). During this time, the initial notification is normally updated once additional information is available, at least every 30 minutes. The status of an advisory, watch, or warning can be upgraded, downgraded, or the impact area expanded based on the new information.

SAN FRANCISCO BAY WATER QUALITY

As described below under "Clean Water Act Section 303(d) and Total Maximum Daily Loads," p. 4.O.22, states must present the EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. The Proposed Project is located adjacent to Lower San Francisco Bay, which extends from approximately the Bay Bridge on the north to the Dumbarton Bridge on the south. The Regional Water Quality Control Board (RWQCB) has listed Lower San Francisco Bay as an impaired water body for chlordane, DDT, dieldrin, dioxins, furan compounds, mercury, polychlorinated biphenyls (PCBs), invasive species, and trash.[44]

The Central Basin of Lower San Francisco Bay, where the CSD structures for the 20th Street sub-basin discharge, is an inlet of San Francisco Bay along the City's bay shoreline. This basin is listed as an impaired water body for chlordane, DDT, dieldrin, dioxin compounds, furan compounds, PCBs, mercury, selenium, and invasive species. The sediments of the Central Basin are listed for mercury and polycyclic aromatic hydrocarbons.

GROUNDWATER RESOURCES

The project site is underlain by the San Francisco Downtown Groundwater Basin, one of five groundwater basins in the eastern part of San Francisco.[45] This basin is separated from the surrounding groundwater basins by bedrock ridges. The groundwater basin is composed of shallow unconsolidated sediments underlain by less permeable bedrock. Bedrock outcrops form much of the northeastern and southern basin boundaries. In general, groundwater flow is towards the northeast, following the topography. Groundwater within the San Francisco Downtown Basin is known to contain elevated concentrations of nitrates, chloride, boron, and total dissolved solids. Historically, groundwater quality in the San Francisco Downtown Groundwater Basin has been

[44] State Water Resources Control Board, 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) — Statewide. Available online at http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed November 28, 2015.

[45] California Department of Water Resources. California's Groundwater, Bulletin 118. February 27, 2004.

affected by a number of fuel leak cases and groundwater in this basin is considered non-potable.[46] The only groundwater extracted from this basin is for dewatering purposes.

TRASH IN WATERWAYS

Trash is of concern for San Francisco Bay because Lower San Francisco Bay is listed as an impaired water body under Section 303(d) of the CWA for trash. Aquatic debris threatens sensitive ecosystems and has been documented to kill or harm nearly hundreds of wildlife species.[47] The debris also interferes with navigation; degrades natural habitats; costs millions of dollars in property damage and lost revenue from tourism and commercial fishing activities; and is a threat to human health and safety. Most aquatic debris comes from land-based sources including littering, legal and illegal dumping, a lack of or poor waste management practices and recycling capacity, stormwater discharges, animal interference with garbage, and extreme natural events. The growing quantity of single-use plastic packaging contributes substantially to the amount of trash transported to waterways. Plastic in the marine environment also breaks into smaller and smaller pieces and it is eaten—often with fatal consequences—by fish, turtles, birds, and marine mammals.

REGULATORY FRAMEWORK

FEDERAL

Clean Water Act – Water Quality

In 1972, the CWA established the basic structure for regulating discharges of pollutants into the waters of the United States and gave the EPA the authority to implement pollution control programs. The CWA sets water quality standards for contaminants in surface waters. The statute incorporates a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, to finance municipal wastewater treatment facilities, and to manage polluted runoff. The EPA has delegated responsibility for implementation of portions of the CWA, including water quality control planning and programs in California, to the SWRCB and the nine RWQCBs. Water quality standards applicable to the Proposed Project are listed in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), discussed further below under "State" in Regulatory Framework on pp. 4.O.25-4.O.26.

[46] San Francisco Bay Regional Water Quality Control Board (RWQCB), Groundwater Committee, San Francisco and Northern San Mateo County Pilot Beneficial Use Designation Project, Part 1: Draft Staff Report, April 4, 1996, Table 3.

[47] National Resources Defense Council, *NRDC News Brief, Waste in our Water: The Annual Cost to California Communities of Reducing Litter That Pollutes our Waterways,* August 2013.

Clean Water Act Section 303(d) and Total Maximum Daily Loads

In accordance with Section 303(d) of the CWA, states must present the EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. The CWA requires the development of total maximum daily loads (TMDLs) to improve water quality of impaired water bodies. Implementation of this program in the project area is conducted by the San Francisco Bay RWQCB.

Clean Water Act Section 401—Water Quality Certification

Section 401 of the CWA requires compliance with State water quality standards for actions within State waters. Compliance with the water quality standards required under Section 401 is a condition for issuance of a Section 404 permit (see below). Under Section 401 of the CWA, every applicant for a Federal permit or license for any activity that may result in a discharge to a water body must obtain a State Water Quality Certification that the proposed activity will comply with State water quality standards.

Clean Water Act Section 402—NPDES Permits

Section 402 of the CWA authorizes the EPA to establish a nationwide surface water discharge permit program for municipal and industrial point sources known as the NPDES program. Under Section 402, the San Francisco Bay RWQCB has set standard conditions for each permittee in the Bay Area, including effluent limitation and monitoring programs. Discharges of stormwater and wastewater from the Proposed Project would be subject to NPDES permits issued to the City.

Clean Water Act Section 404 – Dredging or Filling of Navigable Waters of the U.S.

Under Section 404 of the CWA, a Department of the Army permit must be obtained from the U.S. Army Corps of Engineers (Corps) for the discharge of dredged or fill material into Waters of the United States, including wetlands. The discharge of dredged or fill material typically means adding into waters of the U.S. materials such as concrete, dirt, rock, pilings, or side cast material for the purpose of replacing an aquatic area with dry land or raising the elevation of an aquatic area. Activities typically regulated under Section 404 include the use of construction equipment such as bulldozers, and the leveling or grading of sites where jurisdictional waters occur. Construction activities conducted in the Bay below the high tide line[48] at an elevation of 7.4 feet NAVD88 (96.0 feet project datum) would be subject to CWA Section 404.[49]

[48] The high tide line is the maximum height reached by a rising tide. In the absence of actual data, the high tide line may be determined by physical markings such as a line of oil or scum along the shoreline or a more or less continuous deposit of fine shell or debris on a shoreline or berm.

[49] Moffatt & Nichol, *Pier 70 Development, Preliminary Shoreline Improvements Report, San Francisco, California*, draft report, August 2015.

The Corps reviews applications for permits in accordance with Section 404 guidelines, which have been established by the Corps and EPA. To issue a permit under Section 404, the Corps must ensure that any discharge will not violate the State's water quality standards. Therefore, in California, the proponent of any activity that may result in a discharge to surface Waters of the United States must obtain water quality certification or a waiver of certification from the RWQCB (pursuant to Section 401 of the CWA). The project sponsors would be required to obtain a permit from the Corps under CWA Section 404 to conduct any work below the high tide line.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 prohibits work affecting the course, location, conditions, or capacity of navigable waters of the United States without a permit from the Corps. Navigable waters under the act are those "subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (Title 33 Code of Federal Regulations Section 3294). Examples of activities requiring a permit from the Corps are the construction of any structure in or over any navigable water; excavation or deposition of materials in such waters; and various types of work performed in such waters, including placement of fill and stream channelization. Construction activities conducted in the Bay below the mean high water line at an elevation of 5.7 feet NAVD88 (94.3 feet project datum) would be subject to Section 10 of the Rivers and Harbors Act.

The project sponsors would be required to obtain a permit under Section 10 of the Rivers and Harbors Act from the Corps to conduct any work within its jurisdiction.

Federal Combined Sewer Overflow Control Policy

In 1994, the EPA adopted the Combined Sewer Overflow Control Policy (CSO Control Policy), which became part of the CWA in December 2000. This policy establishes a consistent national approach for controlling discharges from combined sewers to the nation's waters. Using the NPDES permit program, the permittee is required to implement the following nine minimum controls that constitute the technology-based requirements of the CWA and can reduce the frequency of CSDs and their effects on receiving water quality.

1. Conduct proper operation and regular maintenance programs for the combined sewer system and CSD outfalls;
2. Maximize the use of the collection system for storage;
3. Review and modify pretreatment programs to minimize the effect of non-domestic discharges to the collection system;
4. Maximize flow to the SEWPC and North Point Wet Weather Facility for treatment;

5. Prohibit CSDs during dry weather;
6. Control solids and floatable materials in CSDs;
7. Develop and implement a pollution prevention program focused on reducing the effect of CSDs on receiving waters;
8. Notify the public of CSDs; and
9. Monitor to effectively characterize CSD effects and the efficacy of CSD controls.

The City is currently implementing these controls as required by the CSO Control Policy and has also developed a long-term control plan to optimize operations of the City's combined sewer collection and treatment system and maximize pollutant removal during wet weather.

Consistent with the CSO Control Policy and the Long-Term Control Plan, the City captures and treats 100 percent of the combined wastewater and stormwater flow collected in the combined sewer system during precipitation events. Captured flows are directed first to the SEWPCP and North Point Wet Weather Facility for primary or secondary treatment and disinfection. Flows in excess of the capacity of these facilities are diverted to storage and transport boxes constructed around much of the City, and receive the equivalent to primary treatment prior to discharge to San Francisco Bay. The Long-Term Control Plan specifies operational parameters that must be met in each drainage basin before a CSD can occur, and includes the following long-term average annual design goals for CSDs.

- Four CSD events along the North Shore;
- Ten CSD events from the Central Basin (which includes the project site); and
- One CSD event along the Southeast Sector.

The CSO Control Policy allows for this annual average to be exceeded in any particular year as long as the long-term average is maintained at the appropriate level. The City is currently meeting these long-term average design goals for the overall Bayside drainage basin.

Executive Order 11988

Under Executive Order 11988, FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a 1 percent or greater chance of flooding in any given year (the 100-year floodplain). FEMA is a Federal agency whose overall mission is to support citizens and first responders to ensure that the United States builds, sustains, and improves capabilities to prepare for, protect against, respond to, recover from, and mitigate all hazards. With regard to flooding, FEMA provides information, guidance, and regulation associated with flood prevention, mitigation, and response. Under Executive Order 11988, FEMA requires that local governments covered by the Federal flood insurance program pass and enforce a floodplain management ordinance that specifies minimum

requirements for any construction within the 100-year floodplain. Through its Flood Insurance and Mitigation Administration, FEMA manages the National Flood Insurance Program, which includes flood insurance, floodplain management, and flood hazard mapping functions. FEMA maps 100-year floodplains within its jurisdiction and provides flood insurance rate information via flood insurance rate maps.

STATE

California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for protection of the quality of waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a Statewide program for the control of water quality, recognizing that waters of the State are increasingly influenced by interbasin water development projects and other Statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the State. The Statewide program for water quality control is therefore administered most effectively on a local level with Statewide oversight. Within this framework, the act authorizes the SWRCB and RWQCBs to oversee the coordination and control of water quality within California.

San Francisco Bay Water Quality Control Plan (Basin Plan)

San Francisco Bay waters are under the jurisdiction of the San Francisco Bay RWQCB, which established regulatory standards and objectives for water quality in San Francisco Bay in its *Water Quality Control Plan for the San Francisco Bay Basin*, commonly referred to as the Basin Plan.[50] The Basin Plan identifies existing and potential beneficial uses for surface waters and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the Federal CWA. Because beneficial uses, together with their corresponding water quality objectives, can be defined per Federal regulations as water quality standards, the Basin Plan is a regulatory reference for meeting the State and Federal requirements for water quality control.

Adoption or revision of surface water standards is subject to the approval of the EPA. The project site is located adjacent to Lower San Francisco Bay. The CSD structures for the 20th Street sub-basin of the City's combined sewer system discharges to the Central Basin, an inlet of

[50] San Francisco Bay RWQCB, *Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan)*, March 20, 2015. Available online at http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/planningtmdls/basinplan/web/docs/BP_all_chapters.pdf. Accessed November 28, 2015.

Lower San Francisco Bay along the City's Bay shoreline. Identified beneficial uses for the Central Basin of Lower San Francisco Bay are commercial and sport fishing, estuarine habitat, wildlife habitat, water contact recreation, noncontact water recreation, and navigation. Identified beneficial uses for Lower San Francisco Bay are industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation.

Impaired Water Bodies and Total Maximum Daily Loads

As described under "Clean Water Act Section 303(d) and Total Maximum Daily Loads," p. 4.O.22, states must present the EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. As required by the CWA, the EPA requires the development of TMDLs to improve water quality of impaired water bodies. The first step of the TMDL process is development of a TMDL report describing the water quality problem, detailing the pollutant sources, and outlining the solutions. The TMDL report includes an implementation plan that describes how and when pollution prevention, control, or restoration activities will be accomplished and who will be responsible for these actions. The final step of the TMDL process is adopting and amending the Basin Plan to legally establish the TMDL and to specify regulatory requirements for compliance. As part of a Basin Plan amendment, waste load allocations are specified for entities that have permitted discharges.

TMDLs for PCBs and mercury in San Francisco Bay have been approved by the EPA and officially incorporated into the Basin Plan. The San Francisco RWQCB adopted the San Francisco Bay Watershed Permit (Order No. R2-2012-0096), which addresses mercury and PCBs in municipal and industrial wastewater discharges.[51]

National Pollutant Discharge Elimination System Waste Discharge Regulations

As discussed above under "Federal" in Regulatory Framework, p. 4.O.22, Section 402 of the Federal CWA established the NPDES program to protect water quality of receiving waters. The NPDES program requires all facilities that discharge pollutants into waters of the United States to obtain a permit. The permit provides two levels of control – technology-based limits and water-quality-based limits – to control discharge of pollutants for the protection of water quality. Technology-based limits are based on the ability of dischargers in the same category to treat

[51] San Francisco Bay RWQCB, *Waste Discharge Requirements for Mercury and PCBs from Municipal and Industrial Wastewater Discharges to San Francisco Bay, Order No. R2-2012-0096, NPDES No. CA0038849*, adopted December 12, 2012. Available online at http://www.waterboards.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2012/R2-2012-0096.pdf. Accessed November 28, 2015.

wastewater, while water-quality-based limits are required if technology-based limits are not sufficient to protect the water body. Water-quality-based effluent limitations required to meet water quality criteria in the receiving water are based on criteria specified in the National Toxics Rule, the California Toxics Rule, and the Basin Plan. NPDES permits must also incorporate TMDL wasteload allocations when they are developed. In California, the SWRCB and the RWQCBs implement and enforce the NPDES program.

Construction General Stormwater Permit (SWRCB Order No. 2009-09-DWQ)

Stormwater discharges associated with construction activities that disturb more than 1 acre of land and could discharge to San Francisco Bay directly or via a separate stormwater system would be subject to the SWRCB General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (Construction General Stormwater Permit). Construction activities subject to this permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation. Under the Construction General Stormwater Permit, construction projects are characterized by the level of risk to water quality, which is determined using a combination of the sediment risk of the project and the receiving water quality risk. Projects can be characterized as Level 1, Level 2, or Level 3, and the minimum Best Management Practices (BMPs) and monitoring that must be implemented during construction are based on the risk level. The BMPs are designed to prevent pollutants from contacting stormwater and to keep all products of erosion and stormwater pollutants from moving off-site into receiving waters. They are specified in a Stormwater Pollution Prevention Plan (SWPPP) that must be prepared by a Qualified SWPPP Developer (QSD) and submitted to the San Francisco Bay RWQCB before construction begins.

Sediment risk is determined based on the expected intensity of rainfall during the construction period, soil erodibility, and slope of the construction site. Therefore, the sediment risk for the Proposed Project would depend on when it is implemented, and the Proposed Project would have a higher sediment risk if it were implemented during the rainy season rather than the dry season. Receiving water risk is based on whether the project drains to a sediment-sensitive water body. A sediment-sensitive water body is one that appears on the most recent 303(d) list for water bodies as impaired for sediment; has an EPA-approved TMDL implementation plan for sediment; or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning. Lower San Francisco Bay and the Central Basin (the receiving waters) are not considered sediment-sensitive water bodies under the Construction General Stormwater Permit because they are not listed as impaired for sediment and do not have all three beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

Groundwater General Permit (RWQCB Order No. R2-2012-0060)

The RWQCB has issued Order Number R2-2012-0060 (referred to as the Groundwater General Permit), which is a general permit for the discharge or reuse of extracted brackish groundwater, concentrated brine resulting from the treatment of brackish groundwater,[52] and extracted groundwater from structural dewatering that requires treatment. The permit specifies effluent limitations for the discharges, receiving water limitations, and discharge prohibitions (including flow rate and restrictions on scouring and erosion). Monitoring requirements for demonstrating permit compliance are also specified. To obtain authorization to discharge under this permit, the discharger must submit a Notice of Intent describing the proposed discharge and treatment system and the RWQCB must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit. Under this order, extracted groundwater may be reused for purposes such as dust control or soil compaction on construction sites, provided that reuse complies with the water reclamation specifications of the order.

This order does not cover the discharge of groundwater that requires treatment due to contamination from fuels or volatile organic compounds (VOCs). Such discharges must seek coverage under the Volatile Organic Compound and Fuel General Permit, which is described below.

Volatile Organic Compound and Fuel General Permit (RWQCB Order No. R2-2012-0012)

The RWQCB has issued Order Number R2-2012-0012 which is a general permit for the discharge of extracted and treated groundwater resulting from the cleanup of groundwater polluted by VOCs and fuels (referred to as the VOC and Fuel General Permit). The permit specifies effluent limitations for the discharges, receiving water limitations, and discharge prohibitions (including flow rate and restrictions on scouring and erosion). Monitoring requirements for demonstrating permit compliance are also specified. To obtain authorization to discharge under this permit, the discharger must submit a Notice of Intent describing the proposed discharge and treatment system and the RWQCB must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit.

Small MS4 General Stormwater Permit (SWRCB Order No. 2013-001-DWQ)

On February 5, 2013, the SWRCB adopted the General Permit for WDRs for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Order No. 2013-001-DWQ (Small MS4 General Stormwater Permit). Areas that drain to separate stormwater collection systems in San Francisco are subject to this permit. The Phase II General MS4 Permit

[52] Brackish groundwater is groundwater with a high salinity or total dissolved solids content.

identifies specific BMPs and management measures to be addressed and requires permittees to submit a guidance document to the SWRCB documenting their strategies for complying with permit requirements. The required program includes specific elements related to program management, education and outreach on stormwater impacts, public involvement/participation, illicit discharge detection and elimination, construction site stormwater runoff and control, pollution prevention/good housekeeping for permittee operations, post-construction stormwater management for new development and re-development, water quality monitoring requirements, program effectiveness assessment, and annual reporting. For renewal permittees such as the City, the guidance document must identify and describe BMPs included in their previous Stormwater Management Plan that may be more protective of water quality than the minimum requirements of the updated permit, and identify whether the permittee proposes to maintain, reduce, or cease implementation of the BMPs.

Southeast Plant, North Point, and Bayside Facilities NPDES Permit (RWQCB Order No. 2008-0007)

The City currently holds an NPDES permit (RWQCB Order No. R2-2013-0029) adopted by the RWQCB in August 2013 that covers the SEWPCP, the North Point Wet Weather Facility, and all of the Bayside wet-weather facilities, including CSDs to San Francisco Bay.[53] The permit specifies discharge prohibitions, dry-weather effluent limitations, wet-weather effluent performance criteria, receiving water limitations, sludge management practices, and monitoring and reporting requirements. The permit prohibits overflows from the CSD structures during dry weather, and requires wet-weather overflows to comply with the nine minimum controls specified in the Federal Combined Sewer Overflow Control Policy, described above, and the City's Long Term Control Plan. Areas in the Bayside drainage basin that drain to the City's combined sewer system are subject to this permit.

The NPDES permit does not explicitly regulate the number, volume, duration, or frequency of CSDs from the combined sewer system, but instead requires that the system meets the long-term average annual design goals for CSDs from each sub-basin. Under the Long-Term Control Plan, the City must optimize operations of the combined sewer system to minimize CSD frequency, magnitude, and duration and maximize pollutant removal during wet weather, and must also provide treatment of all discharges from the combined sewer system, including CSDs. The NPDES permit also requires the City to monitor the water quality of all CSDs and the efficacy of wet-weather discharge controls. If the CSDs cause a violation of water quality standards in the

[53] San Francisco Bay RWQCB, National Pollutant Discharge Elimination System (NPDES) Permit No. CA0037664, Order No.R2-2013-0029, for City and County of San Francisco Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities and Wastewater Collection System, adopted January 31, 2008.

receiving water, the City must evaluate its Long-Term Control Plan and combined sewer system operation to ensure compliance with water quality standards.

Inland Surface Waters, Enclosed Bays, and Estuaries Plan

On April 7, 2015, the SWRCB adopted an Amendment to the Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Referred to as "the Trash Amendment," this amendment prohibits the presence of trash in inland surface waters, enclosed bays, estuaries, and along shorelines in amounts that adversely affect beneficial uses or cause nuisance. Compliance with this prohibition is achieved through compliance with NPDES permit limitations, WDRs, and waivers. Discharges that are not subject to these regulatory requirements are also required to comply.

MS4 permittees with authority over priority land uses that would be developed under the Proposed Project[54] are required to comply with the discharge prohibitions. Compliance may be achieved using a full capture system for all storm drains (Track 1) or a combination of full capture systems, multi-benefit projects, other treatment controls, and institutional controls (Track 2). These Track 2 measures must achieve a level of control equivalent to full capture under Track 1. The amendment requires that MS4 permits are modified or reissued to address this amendment within 18 months of adoption of the amendment.

The Trash Amendment also requires that trash is eliminated from all stormwater and non-stormwater discharges from construction activities regulated under the Construction General Stormwater Permit. If this is not economically feasible, dischargers must meet the requirements of Track 1 or Track 2, which are described above.

Existing NPDES permits must be modified or reissued to include the requirements of the Trash Amendment within 18 months of adoption of the amendment. Permittees must submit an implementation plan within 3 months of adoption of the implementing permit.

MS4 permittees must achieve full compliance with the requirements of the Trash Amendment within 10 years of the effective date of the first implementing permit, and must achieve interim milestones during the first 10 years to show progress towards achieving full implementation.

McAteer-Petris Act

The McAteer-Petris Act of 1965 established BCDC as a temporary State agency in charge of preparing the *San Francisco Bay Plan* (Bay Plan), described below. In 1969, the act was

[54] Under the Trash Amendment, priority land uses include high-density residential areas with at least 10 developed dwelling units per acre. Commercial uses and mixed urban developments with high-density residential and commercial land uses are also considered priority land uses.

amended to make BCDC a permanent State agency and to incorporate the policies of the Bay Plan into State law.

San Francisco Bay Conservation and Development Commission Permits

The BCDC has permitting authority for most projects in San Francisco Bay and along the shoreline, which is defined in the McAteer-Petris Act to include Bay waters up to the mean high water line and the area 100 feet landward of and parallel to the mean high water line of San Francisco Bay. Under the McAteer-Petris Act, an agency or individual must secure a permit from BCDC if they propose to place fill, dredge sediment, or place dredged materials in San Francisco Bay or certain tributaries within BCDC jurisdiction. Most activities within the 100-foot shoreline band are also subject to a permit from the BCDC. The type of permit issued depends on the nature and scope of the proposed activities. Construction of those elements of the Proposed Project within BCDC's jurisdiction would require a Major Permit under the McAteer-Petris Act.

San Francisco Bay Plan and San Francisco Waterfront Special Area Plan

BCDC completed and adopted the *Bay Plan* in 1968, and the plan has been periodically amended since its adoption, most recently in 2011 to address climate change and shoreline protection. In 1975, after a collaborative planning process with the San Francisco Planning Department, BCDC adopted the *San Francisco Waterfront Special Area Plan* (*Special Area Plan*). The *Special Area Plan* was substantially amended in 2000. This plan, together with the McAteer-Petris Act and the *Bay Plan* and subsequent amendments to all three documents, prescribes a set of rules for shoreline development along the San Francisco waterfront.

Several policies of the *Bay Plan* are aimed at protecting San Francisco Bay's water quality, ensuring the safety of fills, and guiding the dredging activities of the Bay's sediment. The *Bay Plan* policies that are most relevant to the Proposed Project with respect to water quality and hydrology are as follows:

Water Quality

Policy 1: Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses.

Policy 2: Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Basin Plan. The policies, recommendations, decisions, advice, and authority of the State Water Resources Control Board and the San Francisco Bay Regional Water

Quality Control Board should be the basis for carrying out BCDC's water quality responsibilities.

Policy 3: New projects should be sited, designed, constructed, and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain non-polluting materials; and (c) applying appropriate, accepted and effective best management practices, especially where water dispersion is poor and near shellfish beds and other significant biotic resources.

Policy 4: When approving a project in an area polluted with toxic or hazardous substances, the Commission should coordinate with appropriate local, state and federal agencies to ensure that the project will not cause harm to the public, to Bay resources, or to the beneficial uses of the Bay.

Policy 6: To protect the Bay and its tributaries from the water quality impacts of nonpoint source pollution, new development should be sited and designed consistent with standards in municipal stormwater permits and state and regional stormwater management guidelines, where applicable, and with the protection of Bay resources. To offset impacts from increased impervious areas and land disturbances, vegetated swales, permeable pavement materials, preservation of existing trees and vegetation, planting native vegetation, and other appropriate measures should be evaluated and implemented where appropriate.

Policy 7: Whenever practicable, native vegetation buffer areas should be provided as part of a project to control pollutants from entering the Bay, and vegetation should be substituted for rock riprap, concrete, or other hard surface shoreline and bank erosion control methods where appropriate and practicable.

Climate Change

Policy 2: When planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared by a qualified engineer and should be based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current flood protection and planned flood protection that will be funded and constructed when needed to provide protection for the proposed project or shoreline area. A range of sea level rise projections for mid-century and end of century based on the best scientific data available should be used in the risk assessment. Inundation maps used for the risk assessment should be prepared under the direction of a qualified engineer. The risk assessment should identify all types of potential flooding, degrees of uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices.

Policy 3: To protect public safety and ecosystem services, within areas that a risk assessment determines are vulnerable to future shoreline flooding that threatens public safety, all projects—other than repairs of existing facilities, small projects that do not increase risks to public safety, interim projects and infill projects within existing urbanized areas—should be designed to be

resilient to a mid-century sea level rise projection. If it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise based on a risk assessment using the best available science-based projection for sea level rise at the end of the century.

Policy 4: To address the regional adverse impacts of climate change, undeveloped areas that are both vulnerable to future flooding and currently sustain significant habitats or species, or possess conditions that make the areas especially suitable for ecosystem enhancement, should be given special consideration for preservation and habitat enhancement and should be encouraged to be used for those purposes.

Policy 5: Wherever feasible and appropriate, effective, innovative sea level rise adaptation approaches should be encouraged.

Safety of Fills

Policy 2: Even if the Bay Plan indicates that a fill may be permissible, no fill or building should be constructed if hazards cannot be overcome adequately for the intended use in accordance with the criteria prescribed by the Engineering Criteria Review Board.

Policy 3: To provide vitally needed information on the effects of earthquakes on all kinds of soils, installation of strong-motion seismographs should be required on all future major landfills. In addition, the Commission encourages installation of strong-motion seismographs in other developments on problem soils, and in other areas recommended by the U.S. Geological Survey, for purposes of data comparison and evaluation.

Policy 4: Adequate measures should be provided to prevent damage from sea level rise and storm activity that may occur on fill or near the shoreline over the expected life of a project. The Commission may approve fill that is needed to provide flood protection for existing projects and uses. New projects on fill or near the shoreline should either be set back from the edge of the shore so that the project will not be subject to dynamic wave energy, be built so the bottom floor level of structures will be above a 100-year flood elevation that takes future sea level rise into account for the expected life of the project, be specifically designed to tolerate periodic flooding, or employ other effective means of addressing the impacts of future sea level rise and storm activity. Rights-of-way for levees or other structures protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay.

Shoreline Protection

Policy 1: New shoreline protection projects and the maintenance or reconstruction of existing projects and uses should be authorized if: (a) the project is necessary to provide flood or erosion protection for (i) existing development, use, or infrastructure, or (ii) proposed development, use, or infrastructure that is consistent with other Bay Plan policies; (b) the type of the protective

structure is appropriate for the project site, the uses to be protected, and the erosion and flooding conditions at the site; (c) the project is properly engineered to provide erosion control and flood protection for the expected life of the project based on a 100-year flood event that takes future sea level rise into account; (d) the project is properly designed and constructed to prevent significant impediments to physical and visual public access; and (e) the protection is integrated with current or planned adjacent shoreline protection measures. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes, should participate in the design.

Policy 2: Riprap revetments, the most common shoreline protective structure, should be constructed of properly sized and placed material that meet sound engineering criteria for durability, density, and porosity. Armor materials used in the revetment should be placed according to accepted engineering practice, and be free of extraneous material, such as debris and reinforcing steel. Generally, only engineered quarry stone or concrete pieces that have either been specially cast, are free of extraneous materials from demolition debris, and are carefully selected for size, density, and durability will meet these requirements. Riprap revetments constructed out of other debris materials should not be authorized.

Policy 3: Authorized protective projects should be regularly maintained according to a long-term maintenance program to assure that the shoreline will be protected from tidal erosion and flooding and that the effects of the shoreline protection project on natural resources during the life of the project will be the minimum necessary.

Policy 4: Whenever feasible and appropriate, shoreline protection projects should include provisions for nonstructural methods such as marsh vegetation and integrate shoreline protection and Bay ecosystem enhancement, using adaptive management. Along shorelines that support marsh vegetation, or where marsh establishment has a reasonable chance of success, the Commission should require that the design of authorized protection projects include provisions for establishing marsh and transitional upland vegetation as part of the protective structure, wherever feasible.

Policy 5: Adverse impacts to natural resources and public access from new shoreline protection should be avoided. Where significant impacts cannot be avoided, mitigation or alternative public access should be provided.

LOCAL AND REGIONAL REGULATIONS AND PLANS

San Francisco Public Works Code, Article 4.2 – Stormwater Management Requirements and Design Guidelines

Development projects that discharge stormwater to either the combined sewer system or a separate stormwater system must comply with Article 4.2 of the San Francisco Public Works Code, Section 147, which was last updated on April 27, 2016. The SFPUC and the Port have developed San Francisco Stormwater Management Requirements and Design Guidelines in

accordance with the requirements of the Small MS4 General Stormwater Permit and Article 4.2, Section 147.[55]

The Stormwater Management Requirements and Design Guidelines describe the regulatory context for a post-construction stormwater control program and provide tools to help project developers achieve compliance with stormwater management requirements, including but not limited to:

- A set of stormwater BMP fact sheets;
- A vegetation palette to assist in bioretention BMP-appropriate plant selection;
- Sizing calculators to determine the required size of each BMP; and
- Illustrative examples of green infrastructure.

In accordance with the Stormwater Management Requirements and Design Guidelines, developers of projects that create and/or replace 5,000 square feet or more of impervious surface and discharge to the combined sewer system must implement BMPs to manage the flow rate and volume of stormwater going into the combined sewer system by achieving LEED® Sustainable Sites Credit 6.1 (Stormwater Design: Quantity Control). This credit includes two different standards for post-construction stormwater controls depending on the amount of existing impervious surfaces. For covered projects with 50 percent existing impervious surfaces or less, the stormwater management approach must prevent the stormwater runoff flow rate and volume from exceeding existing conditions for storms that produce a rainfall depth of 2.9 inches in 24-hours and a rainfall intensity of approximately 2.4 inches per hour (referred to as the one- and two-year 24-hour design storm). For covered projects that include more than 50 percent existing impervious surfaces, the stormwater management approach must reduce the existing stormwater runoff flow rate and volume by 25 percent for a two-year 24-hour design storm. The Stormwater Management Requirements and Design Guidelines require low-impact development measures to reduce the rate of stormwater runoff and to reduce and delay the volumes of discharge entering the combined sewer system, thereby reducing the frequency of combined sewer overflows, minimizing flooding effects, and protecting water quality. Examples of BMPs that may be implemented include rainwater harvesting, rain gardens, green roofs, and permeable paving.

Developers of projects that discharge to a separate stormwater system must also implement BMPs to reduce the flow rate and volume and improve the quality of stormwater going into the separate stormwater system. In areas served by separate stormwater systems, the Stormwater Management Requirements and Design Guidelines specify different performance requirements according to the following project size thresholds:

- Small Project: 2,500 to 5,000 square feet of impervious surface created and/or replaced.

[55] SFPUC and Port of San Francisco, *San Francisco Stormwater Management Requirements and Design Guidelines*, April 2016.

- Large Project: 5,000 square feet or more of impervious surface created and/or replaced.

Small Projects that discharge to a separate stormwater system must implement one or more site design measure(s) (e.g., tree planting and preservation, permeable pavement, green roofs, vegetated swales, rainwater harvesting, etc.). Large Projects must implement source controls and BMPs to meet performance requirements. Large Projects located in the 28-Acre Site on Port property must manage runoff from storms that produce a rainfall depth of 0.63 inch in 24 hours and a rainfall intensity of approximately 0.2 inch per hour (referred to as the 85th percentile, 24-hour storm). Large Projects within the Hoedown Yard would be under SFPUC jurisdiction and must manage runoff from storms that produce a rainfall depth of 0.75 inch in 24 hours and a rainfall intensity of approximately 0.24 inch per hour (referred to as the 90th percentile, 24-hour storm).

The Stormwater Management Requirements and Design Guidelines also require developers to use certain preferred BMPs to the maximum extent feasible before considering use of remaining BMPs. The preferred BMP hierarchy prioritizes infiltration-based BMPs, rainwater harvesting, and vegetated roofs followed by lined bioretention (e.g., lined bioretention materials with an underdrain, commonly known as a "flow-through planter"). If none of these BMPs are feasible on site, projects may be able to incorporate high-rate filtration BMPs (e.g., tree-box filters and media filters) into their site design pending approval by the SFPUC and Port. For projects located on Port property, both the SFPUC and Port may inspect stormwater BMPs once they are constructed, and any issues noted by the inspection must be corrected. Although the Port is the primary oversight agency for stormwater controls on Port property that discharge to the Port's MS4, the SFPUC is also authorized to inspect stormwater controls on Port property, and would most likely inspect projects that discharge to the City's combined sewer system. For stormwater controls on Port property, the Port tenant, project sponsors, or designated agent is also responsible for completing an annual self-certification inspection, and must submit completed checklists and maintenance logs for the year to the Port and/or SFPUC. In addition, the Port and/or SFPUC inspects all stormwater BMPs every third year and any issues identified by either inspection must be resolved.

Projects on Port property are also subject to the requirements of the 2013 Port Building Code that includes provisions for managing drainage for new construction. Specifically, Section 1503.4 of the Port Building Code allows roofs and other building areas to drain to locations other than the combined sewer (e.g., cisterns, rain gardens).

Modified Compliance Program

The City has developed the Modified Compliance Program to allow development projects with proven site challenges and limitations to modify the standard stormwater performance

requirements set by the Stormwater Management Requirements and Design Guidelines. The Modified Compliance Program applies only to projects served by the combined sewer system.

To qualify for modified compliance, a site owner must submit a modified compliance application to the SFPUC that documents existing and proposed site features that limit infiltration such as high groundwater, shallow depth to bedrock, poorly infiltrating soils, steep slopes, contamination, or limited space for infiltration. The application also requires the applicant to estimate the non-potable demand for the project if the project is subject to the City's Recycled Water Ordinance. Based on this information, the SFPUC can decrease the amount the applicant must reduce the stormwater runoff volume, and would increase the required flow rate reduction by the same percentage.

San Francisco Public Works Code, Article 4.2 – Construction-Related Stormwater Discharges

Discharges of construction-related stormwater runoff are subject to the construction site runoff requirements of Article 4.2 of the San Francisco Public Works Code, Section 146. In accordance with these requirements, developers must obtain a Construction Site Runoff Control Permit for any construction activity that disturbs 5,000 square feet or more of ground surface and all land-disturbing activities, regardless of size, and they must also implement and maintain BMPs to minimize surface runoff, erosion, and sedimentation. Regulated land-disturbing activities include building demolition, clearing, grading, grubbing, filling, stockpiling, excavating, and transporting soil. The permit specifically requires easements for drainage facilities; provision of adequate dust controls in conformance with applicable air pollution laws and regulations; and improvement of any existing grading, ground surface, or site drainage to meet the requirements of Article 4.2. The application for the permit must also include an Erosion and Sediment Control Plan. A building permit cannot be issued until a Construction Site Runoff Control Permit has been issued.

Under the Construction Site Runoff Control Permit, the project sponsors would be required to conduct daily inspections and maintenance of all erosion and sediment controls and must provide inspection and maintenance information to the Port and/or SFPUC. The Port and/or SFPUC would also conduct periodic inspections of the project site to ensure compliance with the plan. The project sponsors would be required to notify the Port and/or SFPUC at least 2 days prior to the start of construction, completed installation of erosion and sediment control measures, completion of final grading, and project completion. At the Port's and/or SFPUC's discretion, sampling, metering, and monitoring also may be required.

San Francisco Public Works Code, Article 4.1—Wastewater Discharges to Combined Sewer System

Discharges of non-sewage wastewater to the combined sewer system are subject to the permit requirements specified in Article 4.1 of the San Francisco Public Works Code and supplemented by SFPW Order No. 158170. The permit requires development and implementation of a pollution prevention program and specifies discharge limitations for specific chemical constituents as well as general conditions for the discharge. In addition, the discharge must meet the pretreatment standards specified in Article 4.1 and the discharger must monitor the discharge quality for compliance with permit limitations. The discharger must also submit periodic reports to the SFPUC, and the City conducts periodic inspections to ensure compliance.

San Francisco Recycled Water Use Ordinance

The City's Recycled Water Ordinance, which added Article 22 of the San Francisco Public Works Code, requires property owners located within the designated recycled water use areas to install recycled water systems in certain development projects. The recycled water use area comprises the majority of the City's bayside waterfront and some inland areas as well as Treasure Island. The goal of the ordinance is to maximize the use of recycled water, and buildings and facilities that are located within the designated recycled water use areas are required to use recycled water for all uses authorized by the State, once a source of recycled water becomes available. Commonly approved uses include irrigation, cooling, and/or toilet and urinal flushing. These systems must meet San Francisco Plumbing and Health Codes, which include specifications for pipe type, pipe separation, backflow prevention assemblies, water meters, and signage.

The following types of developments that are located within the designated recycled water use area must comply with this ordinance:

- New construction or major alterations to a building totaling 40,000 square feet or more;
- All subdivisions; and
- New and existing irrigated areas of 10,000 square feet or more.

In a mixed-use residential building where a recycled water system is installed, any restaurant or other retail food-handling establishment must be supplied by a separate potable water system to ensure public health and safety.

As discussed in Section 4.K, Utilities and Service Systems, under "Recycled Water System," on p. 4.K.10, the SFPUC Eastside Recycled Water Project will ultimately provide an estimated 2 mgd of tertiary recycled water on the bayside of San Francisco. However, the Eastside Recycled Water Project is in the planning stages, with construction not expected to be completed until the

end of 2029.[56] Although the Proposed Project is subject to the Recycled Water Use Ordinance, there is currently no available source of recycled water.

San Francisco Non-potable Water Program

In September 2012, the City adopted the Onsite Water Reuse for Commercial, Multi-family, and Mixed Use Development Ordinance. Commonly known as the Non-potable Water Ordinance, it added Article 12C to the San Francisco Health Code, allowing for the collection, treatment, and use of alternate water sources for non-potable applications. In October 2013, the City amended the ordinance to allow district-scale water systems, defined as systems consisting of two or more buildings sharing non-potable water. The City also amended the ordinance in July 2015, requiring new construction to use alternative water supplies for non-potable use. These amendments became effective on November 1, 2015, and specifically require that:

- All new buildings of 250,000 square feet or more of gross floor area located within the boundaries of San Francisco's designated recycled water use area be constructed, operated, and maintained using available alternate water sources for toilet and urinal flushing and irrigation;
- All new buildings in San Francisco of 40,000 square feet or more of gross floor area prepare water budget calculations; and
- Subdivision approval requirements include compliance with Article 12C of the San Francisco Health Code.

The City is considering adoption of an ordinance that would revise the definition of large and small developments. If adopted, the ordinance would change to definitions for development projects, as follows:

- Large developments: new single buildings of 250,000 square feet or more of gross floor area and multiple buildings constructed in accordance with a phased plan or approval with a total gross floor area of 250,000 square feet or more.
- Small development projects: single buildings of 40,000 square feet or more of gross floor area and multiple buildings constructed in accordance with a phased plan or approval with a total gross floor area of 40,000 square feet or more.

If adopted, all developments within the Pier 70 Special Use District would need to comply with the non-potable water ordinance because they would be part of a subdivision approval comprising more than 250,000 square feet of gross floor area.

Effective November 1, 2016, new buildings of 250,000 square feet or more of gross floor that are located outside the boundaries of San Francisco's designated recycled water use area must also be

[56] SFPUC, *San Francisco Eastside Recycled Water Project*. Available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=311. Accessed December 29, 2015.

constructed, operated, and maintained using available alternate water sources for toilet and urinal flushing and irrigation.

There are six steps for complying with the Non-potable Water Ordinance, which is implemented by the SFPUC, DBI, and DPH:[57]

1. Submit a water budget application to SFPUC that assesses water supplies and non-potable water demands.
2. Submit an engineering report to DPH that provides a detailed design and the technical aspects of the on-site water system.
3. Obtain permits from DBI and complete construction.
4. Schedule a cross connection test with the SFPUC to ensure separation of potable and non-potable water systems.
5. Obtain a Permit to Operate from DPH and begin operating the on-site water system with DPH oversight.
6. Conduct ongoing monitoring, reporting, and inspections.

In accordance with the Permit to Operate, the on-site water system must treat the alternative water supply to water quality criteria specified by the DPH, and these criteria are dependent on the alternate water source and end use for the water. Filtration and disinfection are the primary treatment processes implemented; however, disinfection may not be required if the system is used solely for subsurface irrigation where there is no human exposure.

The DPH has designated the following three consecutive operational modes for on-site water systems:

- Start-Up Mode: For the first 90 days, the alternate water source is treated and discharged to the combined sewer system while the system performance is monitored. Potable water is supplied to all end uses.
- Temporary Use Mode: For the following 9 months, the alternate water source is treated and supplied to the approved non-potable end uses with frequent monitoring.
- Final Use Mode: After satisfying all temporary use requirements, the system is put into Final Use Mode. Once a final permit is issued by DPH, an annual license renewal is required to continue operation and use of the on-site water system.

On-site water systems that collect and treat rainwater and/or stormwater are required to operate in the Start-Up and Final Use Modes; however, these systems are not required to operate under the

[57] San Francisco Water, Power, Sewer; San Francisco Department of Building Inspection; San Francisco Department of Public Health, Environmental Health, *San Francisco's Non-potable Water Program, A Guidebook for Implementing Onsite Water Systems in the City and County of San Francisco*, March 2015. Available online at http://sfwater.org/modules/showdocument.aspx?documentid=4962. Accessed December 14, 2015.

Temporary Use Mode. On-site water systems that collect and treat foundation water, graywater, and blackwater must operate under the Temporary Use Mode to demonstrate achievement of water quality standards before being operated in the Final Use Mode.

The project site is located within a designated recycled water use area;[58] therefore, the requirements of the Non-potable Water Program apply to the Proposed Project.

Well Permitting Requirements

In accordance with Article 12B of the San Francisco Health Code, DPH must permit any groundwater well or soil boring. To obtain a permit, the party responsible for installing and operating the well must submit a well permit application to the DPH that specifies the well location, proposed use, and anticipated operational life; construction parameters; and a plan for the safe and appropriate disposal of any drilling fluids or other drilling materials. The application must also include approval from the SFPUC if any drilling fluids or groundwater would be discharged to the sanitary sewer. The well must be constructed in accordance with the water well standards of the State of California and Article 12B of the San Francisco Health Code. It may not be constructed until a well construction permit is issued by the DPH.

San Francisco Sea Level Rise Guidance

The City has developed guidance for incorporating sea level rise into the planning of capital projects implemented by the City.[59] The guidance presents a framework for considering the effects of sea level rise and for selecting appropriate adaptation measures based on site-specific information. The planning process described in the guidance includes six primary steps:

1. Review sea level rise science.
2. Assess vulnerability.
3. Assess risk.
4. Plan for adaptation.
5. Implement adaptation measures.
6. Monitor.

[58] SFPUC, *Recycled Water Us*e. Available online at http://www.sfwater.org/index.aspx?page=687. Accessed November 29, 2015.

[59] City and County of San Francisco Sea Level Rise Committee, *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*. September 22, 2014. Available online at http://onesanfrancisco.org/wp-content/uploads/San%20Francisco%20SLR%20Guidance%20Adopted%209.22.14%2012182014.pdf. Accessed November 29, 2015.

As discussed above, as of September 2014, the City considers the NRC Report as the best available science on sea level rise in California. However, the guidance acknowledges that the science of sea level rise is continually advancing and projections of sea level rise may need to be updated at some point to reflect the most updated science. Sea level rise inundation maps prepared by the SFPUC, described above under "Sea Level Rise Inundation Mapping," pp. 4.O.12-4.O.13, are considered the most up-to-date maps and take into account both water level rises and the temporary effects of storm surge along the shoreline based on existing topography and conditions. The guidance states that the review of available sea level science should determine whether the project site could be subject to flooding during the lifespan of the project.

For those projects costing 5 million dollars or more that could be flooded during their lifespan, the guidance requires a vulnerability assessment based on the degree of flooding that could occur, the sensitivity of the project to sea level rise, and the adaptive capacity of the project site and design (the ability to adjust to sea level rise impacts without the need for substantial intervention or modification). The risk assessment takes into consideration the likelihood that the project could be adversely affected by sea level rise and the related consequences of flooding. An adaptation plan is required for projects that are found to be vulnerable to sea level rise and have a potential for substantial consequences. The plan should focus on those aspects of the project that have the greatest consequences if flooded. It should include clear accountability and trigger points for bringing adaptation strategies online as well as a well-defined process to ensure that milestones are being met and the latest science is being considered.

The City sea level rise guidance document also acknowledges that there is some flexibility in how to plan for adaptations, and it may not always be feasible or cost effective to design and build for long-term potential sea level rise scenarios that are of a highly uncertain nature, such as the upper end of the NRC Report range for the year 2100 (66 inches of sea level rise). In this case, a capital project constructed by the City could be designed and constructed to be resilient to the likely mid-century sea level rise (11 inches by 2050). Under this guidance, an alternative approach for a City capital project would be to build the project to be resilient to the *likely* sea level rise by 2100 (36 inches), while including adaptive capacity to be resilient to the *upper range* of sea level rise estimates for 2100 (66 inches).

Trash Management

Article 6 of the San Francisco Health Code, Garbage and Refuse, requires that properties have appropriate containers placed in appropriate locations for the collection of refuse. In accordance with this article, the refuse containers must be constructed with tight-fitting lids or sealed enclosures, and the contents of the container may not extend above the top of the rim. The property owner must also have adequate refuse collection service. Article 6 also prohibits the dumping of refuse onto any streets or lands within San Francisco.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on hydrology and water quality. Implementation of the Proposed Project would have a significant effect on hydrology and water quality if the project would:

- O.1 Violate any water quality standards or waste discharge requirements.
- O.2 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- O.3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.
- O.4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- O.5 Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- O.6 Otherwise substantially degrade water quality.
- O.7 Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map.
- O.8 Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- O.9 Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- O.11 Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

Because of the Proposed Project's location, there would be no impact related to Criterion O.9, flooding as a result of failure of a levee or dam, because there are no levees or dams in the

vicinity of the project site, and the project site is not located within the inundation area of any San Francisco reservoirs.[60]

APPROACH TO ANALYSIS

This analysis evaluates the Proposed Project's potential effects related to hydrology and water quality. Potential water quality impacts are assessed with respect to the potential for the Proposed Project to result in an exceedance of water quality criteria or exceedance of WDRs, including NPDES permit effluent limitations and the frequency and composition of CSDs. In addition, the impact analysis assesses potential impacts related to groundwater depletion and recharge as well as changes in stormwater flows and flooding (including flooding as a result of 100-year flooding under existing conditions, future flooding as a result of sea level rise, and flooding as a result of a tsunami). The impact analysis assumes that all construction and operations would be completed in compliance with applicable regulations, including the NPDES and City permit requirements related to stormwater permitting requirements and discharges to the combined sewer system or a surface water (i.e., San Francisco Bay). If compliance with these standards would ensure that impacts related to water quality would be less than significant, then no mitigation is necessary. The analysis of flooding impacts considers whether increasing the site grade by up to 5 feet, as would occur under the Proposed Project to alleviate the effects of flooding, would adversely impede or direct existing or future flood flows, or otherwise exacerbate flooding conditions. If not, impacts related to flooding would be less than significant and no mitigation is necessary.

The location, depth, and area of ground disturbance within the project site would be substantially similar under the Maximum Residential Scenario and the Maximum Commercial Scenario, all three options for stormwater/wastewater treatment, all three options for grading around Building 12, and the construction of shoreline improvements. To the extent that the particular locations, depths, and areas of ground disturbance may differ somewhat from one to another, they are generally included and accounted for in an assumption of maximum ground disturbance within the project site.

The regulatory requirements for erosion control and discharge requirements applicable to the Proposed Project are equally applicable to all of the Proposed Project scenarios. However, the regulatory requirements differ according to the option implemented for stormwater and wastewater management, depending on whether discharges would be made to the combined sewer system under Options 1 and 3 or to the proposed separate stormwater system under Options 2 and 3. The regulatory requirements related to both systems are discussed separately in Impact HY-2. Similarly, the potential effects related to a change in the frequency of CSDs differ

[60] San Francisco Planning Department, *Community Safety, an Element of the General Plan of the City and County of San Francisco,* October 2012, Map 06.

according to the option implemented, and these effects are also discussed separately in Impact HY-2.

PROJECT FEATURES

During construction, stormwater discharges and discharges of groundwater produced during excavation dewatering have the potential to exceed water quality criteria or WDRs, including NPDES and City permit effluent limitations. The project-related activities that could result in these impacts include grading and excavation for the construction of basements for new buildings and improvements to Building 12; renovation of Buildings 2, 12, and 21; construction of street improvements (including the new 21st Street); construction of the new 20th Street Pump Station northeast of the project site that includes a basement approximately 20 feet below ground surface; and installation of new utilities for potable water, recycled water, fire protection water, wastewater, stormwater, electricity, and natural gas. In-bay construction activities could also affect Bay water quality. These activities include construction of the shoreline improvements and modifications to the existing 20th and 22nd streets CSD outfall structures. These impacts apply to construction equally to all project scenarios and options. Construction of a new outfall for the separate storm drain system that would be constructed under Options 2 and 3 would also involve in-bay construction and could also affect San Francisco Bay water quality.

During operation, the specific Proposed Project elements that could result in hydrology and water quality impacts include discharges of wastewater and stormwater runoff from the project site that could exceed the capacity of the stormwater system, provide additional sources of polluted runoff, exceed water quality criteria, or result in changes in CSD frequencies. The Proposed Project includes three wastewater and stormwater management options: installation of new on-site combined sewer facilities and connection to the SFPUC combined sewer system (Option 1); construction of a new separate stormwater system and a new separate wastewater system (Option 2); and development of a hybrid system (Option 3) that would use the City's combined sewer system for a portion of the site and construct a new separate system for the remainder of the site. The analysis presents the regulatory requirements for each option and discusses the potential changes in the frequency and composition of CSDs. This section also analyzes the Proposed Project's use of an alternative water supply for non-potable uses, and discusses the regulatory requirements for such use.

In addition, the impact analysis assesses potential impacts related to changes in stormwater flows and flooding (including flooding as a result of 100-year flooding under existing conditions, future flooding as a result of sea level rise, and flooding as a result of a tsunami). These impacts apply to construction and operation of all of the proposed infrastructure, buildings, and shoreline protection improvements regardless of the project scenario or option implemented.

IMPACT EVALUATION

Construction Impacts

Impact HY-1: Construction of the Proposed Project would not violate a water quality standard or a waste discharge requirement, or otherwise substantially degrade water quality. ***(Less than Significant)***

Construction of the Proposed Project would include both on-land construction activities that are conducted above the high tide line which occurs at an elevation of 7.4 feet NAVD88 (96.0 feet project datum) and in-bay construction activities that would occur below the high tide level. Water quality impacts related to on-land and in-bay construction activities are described separately below, followed by a discussion of impacts related to construction dewatering. All of these impact analyses discuss the regulatory requirements in place to ensure that construction activities would not violate water quality standards or WDRs, or substantially degrade water quality.

Water Quality Effects of On-Land Construction Activities

Grading and earthmoving for the on-land construction of utilities and infrastructure by the project sponsors, demolition of existing buildings, and construction of individual development projects within the project site would expose soil during construction and without proper controls, these activities could result in erosion and excess sediments carried in stormwater runoff. Stormwater runoff from temporary on-site use and storage of vehicles, fuels, wastes, and building materials could also carry pollutants if these materials were improperly handled.

However, the CWA effectively prohibits discharges of stormwater from construction projects unless the discharge is in compliance with an NPDES permit. As discussed below under the impact analyses for construction-related stormwater discharges, during construction, stormwater from the project site would drain to the City's combined sewer system, a new separate stormwater system constructed under the Proposed Project, or directly to San Francisco Bay. Construction-related stormwater discharges to the combined sewer system would be in accordance with the Bayside NPDES Permit, and construction-related stormwater discharges to the separate stormwater system or directly to San Francisco Bay would be in accordance with the Construction General Stormwater Permit. Both of these NPDES permits apply to on-land construction activities that would be conducted inland of the high tide line which occurs at an elevation of 7.4 feet NAVD88 (96.0 feet project datum).

Construction-Related Stormwater Discharges to Combined Sewer System

Construction activities conducted within areas served by the City's existing combined sewer system or the new combined sewer system infrastructure that would be constructed under Option 1, Combined Sewer System, and Option 3, Hybrid System, for the proposed stormwater and wastewater facilities would be subject to the Construction Site Runoff requirements of Article 4.2 of the San Francisco Public Works Code, Section 146. Applicable activities include construction of utilities, roadways, other infrastructure, and demolition of existing buildings, as well as excavation for construction of the proposed buildings.

The Construction Site Runoff Control Permit is required for projects that involve any land-disturbing activities such as building demolition, clearing, grading, grubbing, filling, stockpiling, excavating, and transporting soil. The permit application must include an Erosion and Sediment Control Plan that provides a vicinity map showing the location of the site in relationship to the surrounding area's water courses, water bodies, and other significant geographic features; a site survey; suitable contours for the existing and proposed topography; area drainage; proposed construction and sequencing; proposed drainage channels; proposed erosion and sediment controls; dewatering controls where applicable; soil stabilization measures where applicable; maintenance controls; sampling, monitoring, and reporting schedules; and any other information deemed necessary by the SFPUC. The Erosion and Sediment Control Plan would also include the appropriate BMPs to prevent stormwater contact with hazardous materials stored at the construction site and limit the potential for a release of these hazardous materials that could affect water quality.

Article 4.2 also specifies that the contractor must provide adequate dust controls in conformance with applicable air pollution laws and regulations (including Article 22B of the San Francisco Health Code, described in Section 4.P, Hazards and Hazardous Materials, and Section 4.G, Air Quality). Improvements to any existing grading, ground surface, or site drainage must also meet the requirements of Article 4.2 for new grading, drainage, and erosion control. A building permit cannot be issued until a Construction Site Runoff Control Permit has been issued.

Under the Construction Site Runoff Control Permit, the project sponsors would be required to conduct daily inspections and maintenance of all erosion and sediment controls and must provide inspection and maintenance information to the SFPUC. The SFPUC would also conduct periodic inspections of the project site to ensure compliance with the plan. The project sponsors would be required to notify the SFPUC at least 2 days prior to the start of construction, completed installation of erosion and sediment control measures, completion of final grading, and project completion. At the SFPUC's discretion, sampling, metering, and monitoring may also be required.

Implementation of the Construction Site Runoff requirements of Article 4.2 of the San Francisco Public Works Code, Section 146, would ensure that water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of construction-related stormwater runoff in areas served by the existing or future combined sewer system would be less than significant. No mitigation is necessary.

Construction-Related Stormwater Discharges to Separate Stormwater System or to Bay

Construction activities conducted within areas that drain to San Francisco Bay or to the proposed separate stormwater system that would be constructed under Options 2 and 3 for the proposed stormwater and wastewater facilities (separate systems and hybrid system) would be subject to the Construction General Stormwater Permit. Applicable activities include construction of the shoreline improvements above the high tide line and construction for the installation of new utilities, roadways, and other infrastructure, as well as demolition of existing buildings and excavation for construction of the proposed buildings.

Construction of the shoreline improvements has the greatest potential to cause water quality effects in San Francisco Bay because these activities would involve excavation, disruption of slopes, and placement of rock immediately adjacent to San Francisco Bay, particularly in Reach I where an entirely new riprap revetment would be constructed. Improvements in Reaches III and IV include repair of the existing slope protection features with armor stone, which would also involve some rearrangement of existing riprap and associated soil disturbance. The on-land component of these improvements would be constructed along the shoreline slope between the high tide line at 7.4 feet NAVD88 (96.0 feet project datum) and the top elevation of the shoreline improvements at 15.4 feet NAVD88 (104.0 feet project datum). The maximum slope in each reach is about 30 percent. Sediment from these construction activities could potentially become entrained in stormwater runoff, or a release of hazardous materials could occur, potentially degrading water quality in San Francisco Bay.

Excavation for the installation of new utilities, roadways, and other infrastructure, as well as demolition of existing buildings and excavation for the proposed developments, could also result in runoff to the new separate stormwater system, if Option 2 or Option 3 for the proposed stormwater and wastewater facilities (separate systems and hybrid system) is implemented. As this new separate stormwater system would discharge to San Francisco Bay via a new outfall, stormwater runoff from construction activities that discharge to this system could carry sediment or a release of hazardous materials used during construction, potentially degrading water quality in San Francisco Bay.

Under the Construction General Stormwater Permit, construction of the shoreline improvements and other on-land construction activities that would drain to the new separate stormwater system,

if constructed, would be characterized by the level of risk to water quality. This is determined using a combination of the sediment risk of the project and the receiving water quality risk. Projects can be characterized as Risk Level 1, Level 2, or Level 3, and the minimum BMPs and monitoring that must be implemented during construction are based on the risk level. The BMPs are designed to prevent pollutants from coming into contact with stormwater and to keep all products of erosion and stormwater pollutants from moving offsite into receiving waters. They are specified in a SWPPP that must be prepared by a QSD and submitted to the San Francisco RWQCB before construction begins. Construction activities under the Proposed Project would not be characterized as Risk Level 3, because the Central Basin and Lower San Francisco Bay are not considered sediment-sensitive water bodies under the Construction General Stormwater Permit.

For construction activities characterized as Risk Level 1, the Construction General Stormwater Permit specifies minimum BMPs to be implemented that address good housekeeping practices (including those for managing hazardous materials used during construction), non-stormwater management, erosion and sediment control, and run-on and runoff control. A qualified professional must inspect the required BMPs weekly when there is no rain and daily during a qualifying rainstorm. For construction activities characterized as Risk Level 2, the minimum requirements identified for Risk Level 1 apply in addition to some more stringent requirements. For instance, erosion controls must be implemented in conjunction with sediment controls in active construction areas, and linear sediment controls such as silt fences, gravel bag berms, or fiber rolls must be used along slopes. In addition, a QSD must prepare a rain event action plan for Risk Level 2 construction activities. This plan would identify the designated site stormwater manager, the provider of erosion and sediment controls, and the stormwater sampling agent, as well as the types of construction workers active at the site during all construction phases. The plan would include suggested actions for each construction phase.

Compliance with the Construction General Stormwater Permit would ensure that water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of construction-related stormwater runoff to San Francisco Bay, either directly or via the new separate stormwater system (if constructed), would be less than significant. No mitigation is necessary.

Water Quality Effects of In-Bay Construction Activities

As discussed in “Wetlands and Other Jurisdictional Waters” in Section 4.M, Biological Resources, pp. 4.M.18-4.M.19, San Francisco Bay is a navigable water of the United States. Therefore, San Francisco Bay is considered a jurisdictional water of the U.S. regulated by the Corps under Section 10 of the Rivers and Harbors Act up to the mean high water mark, which is at an elevation of 5.7 feet NAVD88 (94.3 feet project datum). San Francisco Bay is also

considered jurisdictional waters of the U.S. and regulated by the Corps under Section 404 of the CWA up to the high tide line which is at an elevation of 7.4 feet NAVD88 (96.0 feet project datum). These waters are also regulated by the RWQCB as Waters of the State and BCDC regulates the fill and extraction of materials in San Francisco Bay below the mean high water mark (see Impact BI-4 in Section 4.M, Biological Resources, pp. 4.M.69-4.M.71, for further discussion of the requirements specified by these regulations). Therefore, any work along San Francisco Bay shoreline below the high tide line which is at an elevation of 7.4 feet NAVD88 (96.0 feet project datum) is considered construction in the Bay.

The Proposed Project includes several features that would involve in-bay construction and therefore would be subject to these regulations: repairs to the shoreline protection system in Reaches I, III, and IV of San Francisco Bay shoreline that are below the high tide line; repair or replacement of the bulkhead in Reach II of San Francisco the Bay shoreline as part of the shoreline improvements; repair of two existing CSD structures at 20th and 22nd streets; and construction of a new stormwater outfall for the separate stormwater system that would be constructed under Option 2, Separate Wastewater and Stormwater Systems, and Option 3, Hybrid System. The proposed shoreline improvements would result in approximately 2,200 cubic yards of excavation and 2,070 cubic yards of fill below the high tide level.[61] These activities are described in more detail below, followed by a discussion of applicable regulatory requirements that would ensure that adverse water quality effects do not result from the proposed in-bay construction activities.

Repairs to Shoreline Protection System in Reaches I, III, and IV

In Reach I, the existing riprap revetment would be repaired by removing the riprap and placing new geotextile fabric and riprap materials. Improvements in Reaches III and IV would include repair of the existing slope protection features with armor stone, which would also involve some rearrangement of existing riprap and associated soil disturbance. In addition, some concrete debris would be removed from Reach III and replaced with engineered riprap between the craneways. Those activities conducted below the high tide line would be considered in-bay construction activities.

Repair or Replacement of Bulkhead in Reach II

The two options under consideration for the repair/replacement of the bulkhead in Reach II include installation of a sheet pile or soldier pile wall. Under the sheet pile wall option, interlocking steel sheet piles would be installed. The sheet piles would be driven below the water

[61] Moffatt & Nichol, *Pier 70 Development, Preliminary Shoreline Improvements Report, San Francisco, California*, draft report, August 2015.

surface without the need for temporary cofferdams or dewatering. Under the soldier pile wall option, individual piles would be spaced a short distance apart, with gaps between the piles filled with lagging. The piles would be cast-in-drilled-hole piles, which are built by drilling a hole and inserting a reinforcing cage, then filling the hole with concrete. Installing a soldier pile wall may require temporary cofferdams or dewatering.

Repair of Combined Sewer Discharge Structures and Construction of New Outfall

The existing 20th and 22nd streets CSD structures would remain in approximately the same locations and would be repaired. The repairs may include reconstruction or repair of the existing outfall pipe, foundation, adjacent rock slope, and headwalls. Flap gates to control intrusion of San Francisco Bay water would be constructed, if necessary, and any blockages would be removed. Repair of the structures may require a sheet pile cofferdam at each location to allow for dewatering of the construction area to facilitate construction. The extent of excavation has not been determined for construction of the proposed stormwater outfall that would be constructed under Options 2 and 3, but excavation would likely extend below the high tide line.

Impact Discussion and Conclusion for In-Bay Construction Activities

Excavation, fill, and construction activities for improvements to the shoreline protection system in Reaches I, III, and IV; the repairs or replacement of the bulkhead in Reach II; repairs to the two CSD structures; and construction of the stormwater outfall, would be considered in-bay construction and would result in short-term disturbance of localized San Francisco Bay sediments. The disturbance would temporarily re-suspend these sediments in San Francisco Bay waters, which could result in temporary adverse water quality effects including increased turbidity and suspended solids in the immediate vicinity of the construction activities. The sediments may also contain chemicals from historic activities, including those identified in the offshore sediments adjacent to Reaches III and IV from Pacific Gas and Electric Company (PG&E) activities (see Section 4.P, Hazards and Hazardous Materials, pp. 4.P.34-4.P.35, for a description of PG&E's plans for remediation of the offshore sediments). Turbidity is a condition in which the concentration of particles suspended in the water is increased, making the water appear cloudy. The suspended solids can lower the levels of dissolved oxygen levels in water, increase the salinity of the water, and decrease light penetration into the water. In addition, nutrient loading can occur as a result of resuspension of sediments.

However, the overall water quality effect would be minor because of the very small area that would be disturbed and the temporary nature of the disturbance. Further, these in-bay construction activities would be subject to the requirements of a Section 10 and Section 404 permit from the Corps that would receive water quality certification from the RWQCB in accordance with Section 401 of the CWA. Further, placement of fill below the high water mark

would be subject to a permit from the BCDC, which would ensure that the water quality policies of the Bay Plan are implemented. The permits would specify BMPs for the protection of water quality such as use of floating booms and/or silt curtains to control the dissipation of bottom sediments during pile and rock installation. Implementation of water quality control measures as part of compliance with the Section 10 or Section 404 permit requirements, subject to water quality certification by the RWQCB, along with the requirements of the BCDC permit, would ensure that the anticipated temporary water quality impacts related to construction activities in San Francisco Bay would be less than significant. No mitigation is necessary.

Water Quality Effects of Groundwater Dewatering

As noted in "Groundwater" in Section 4.N, Geology and Soils, p. 4.N.6, the groundwater level at the project site is about 6 to 29 feet below ground surface. Given that the estimated depth of excavation on the site would be 15 to 27 feet for the construction of basements, construction-related groundwater dewatering would likely be required. However, the Proposed Project would be designed such that permanent dewatering would not be required, because the proposed buildings would be constructed to withstand hydrostatic pressure from the surrounding groundwater and would be waterproofed to prevent intrusion of groundwater.

The project sponsors have evaluated two options for discharge of groundwater produced during construction dewatering: (1) directly discharging to the City's combined sewer system; and (2) installing an on-site dewatering treatment system and discharging the treated water to San Francisco Bay. If discharged to the combined sewer system, groundwater discharges would be subject to Article 4.1 of the Public Works Code, as supplemented by SFPW Order No. 158170, which regulates the quantity and quality of discharges to the combined sewer system. In accordance with Article 4.1 and SFPW Order No. 158170, the discharger would be required to obtain a permit for the discharges and the permit would contain appropriate discharge standards. The permit may also require installation of meters to measure the volume of the discharge. The groundwater could contain contaminants related to past site activities, as discussed in Section 4.P, Hazards and Hazardous Materials, on pp. 4.P.11-4.P.16, as well as sediment and suspended solids, but would be treated as necessary to meet the discharge limitations of Article 4.1 and SFPW Order No. 158170. Treatment could include methods such as using settling tanks to remove sediments; filters to remove suspended solids; and other methods to meet chemical-specific discharge limitations. The chemical-specific treatment method used would depend on the chemicals that exceed the specified discharge limitation, but could include methods such as filtration or activated carbon treatment to reduce chemical concentrations as necessary to meet permit requirements prior to discharge.

If discharged directly to San Francisco Bay, the groundwater discharges could be subject to permitting requirements of the RWQCB under the Groundwater General Permit or the VOC and Fuel General Permit. These permits specify water quality criteria and monitoring requirements for discharges of extracted groundwater. Accordingly, under this option, the project sponsors would be required to submit a Notice of Intent to the RWQCB describing the proposed discharge and treatment system. The RWQCB must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit. The contractors would install an on-site treatment system(s) as needed to comply with the effluent limitations of the applicable discharge permit. The treated water would likely be discharged through a temporary discharge structure and regular influent and effluent water quality monitoring would be conducted to demonstrate permit compliance. Alternatively, an individual NPDES permit from the RWQCB would be required, and would impose similar requirements.

With discharge to the combined sewer system or San Francisco Bay in accordance with the regulatory requirements described above, water quality impacts related to a violation of water quality standards or degradation of water quality due to discharge of groundwater produced during construction-related dewatering would be less than significant, and no mitigation is necessary.

If groundwater wells are required for construction dewatering, the wells could provide a downward conduit for contamination, potentially affecting groundwater quality, if not properly constructed. However, the project sponsors would be required to obtain a well construction permit for any dewatering wells in accordance with the well permitting requirements described above under “Well Permitting Requirements,” p. 4.O.41. The permit would specify requirements for construction of the wells in accordance with the water well standards of the State and Article 12B of the San Francisco Health Code, including requirements for placement of a seal around the wells, referred to as an annular seal, to prevent the downward migration of contaminants. This would ensure that any wells installed for construction-related dewatering would not provide a downward conduit for contamination that could adversely affect groundwater quality. Therefore, water quality impacts associated with installation and operation of the dewatering wells would be less than significant, and no mitigation is necessary.

Operational Impacts

Impact HY-2: The Proposed Project could violate a water quality standard or waste discharge requirement or otherwise substantially degrade water quality, but runoff from the Proposed Project could exceed the capacity of a storm drain system or provide a substantial source of stormwater pollutants. ***(Less than Significant with Mitigation)***

The Proposed Project includes three options for stormwater and wastewater management: Option 1, Combined Sewer System; Option 2, Separate Wastewater and Stormwater Systems; and Option 3, Hybrid System, all of which are described in "Wastewater and Stormwater Flow Options" in Chapter 2, Project Description, pp. 2.61-2.66. Under Option 1, Combined Sewer System, stormwater and wastewater flows from the project site would be conveyed to the SEWPCP for treatment via the City's combined sewer system. Under Option 2, Separate Wastewater and Stormwater Systems, wastewater from the project site would continue to be conveyed to the City's combined sewer system for treatment at the SEWPCP. A new separate stormwater system would also be constructed under this option to convey stormwater flows to a new outfall located near the foot of the realigned 21st Street and the new outfall would discharge stormwater to the Central Basin of Lower San Francisco Bay. Under Option 3, Hybrid System, the combined sewer would continue to serve most of the project site and would convey wastewater and stormwater to the SEWPCP for treatment. The area to the east of the proposed Maryland Street, including the proposed open space areas, would be served by a new separate stormwater system that would convey stormwater flows to a new outfall located near the foot of the realigned 21st Street; the new outfall would discharge stormwater to the Central Basin of Lower San Francisco Bay. Wastewater from this portion of the site would be conveyed in the combined sewer system to the SEWPCP for treatment. The effects of each option on water quality and storm drain system capacity are discussed below.

Water Quality Effects Related to Exceedance of Water Quality Criteria and Waste Discharge Requirements

Discharges to the Combined Sewer System

Option 1, Combined Sewer System, and Option 3, Hybrid System, would both involve discharges of wastewater and stormwater to the City's combined sewer system, and Option 2, Separate Wastewater and Stormwater Systems, would involve discharges of wastewater to the combined sewer system. However, these discharges would not violate water quality standards or otherwise degrade water quality because all discharges would be in accordance with City regulatory requirements that have been developed to ensure compliance with the Bayside NPDES permit.

Wastewater discharges from future development projects would be subject to the permit requirements of Article 4.1 of the San Francisco Public Works Code and supplemented by SFPW Order No. 158170. Accordingly, future commercial users of the site would be required to develop and implement a pollution prevention program and comply with the pretreatment standards and discharge limitations specified in Article 4.1. These dischargers would also be required to monitor the discharge quality for compliance with permit limitations.

Stormwater discharges to the combined sewer system under Options 1 and 3 would be subject to Article 4.2 of the San Francisco Public Works Code, Section 147 and the San Francisco Stormwater Management Requirements and Design Guidelines that apply to future development projects that create and/or replace 5,000 square feet or more of impervious surfaces. Under Option 1, all future development projects would discharge stormwater to the combined sewer system. Covered projects that include more than 50 percent existing impervious surfaces must reduce the stormwater runoff flow rate and volume from the site by 25 percent for a two-year 24-hour storm. For covered projects with less than 50 percent existing impervious surfaces, the stormwater management approach must prevent the stormwater runoff flow rate and volume from exceeding existing conditions for the one- and two-year 24-hour design storm. Alternatively, if site conditions limit infiltration of stormwater, the project sponsors may apply for modified compliance with the Stormwater Management Ordinance and Stormwater Design Guidelines to adjust the amount by which the project must reduce the stormwater runoff volume and flow rate relative to existing conditions.

The Stormwater Management Requirements and Design Guidelines require the use of the low-impact development measures to reduce runoff and to reduce and delay the volumes of discharge entering the combined sewer system, thereby reducing the frequency of combined sewer overflows, minimizing flooding effects, and protecting water quality. One method of reducing stormwater runoff volumes would be to increase the amount of pervious surfaces by providing planters or other unpaved surfaces so that stormwater can infiltrate the ground. Other options include replacing asphalt or concrete with pervious asphalt or other hard pervious surfaces that allow rainwater to percolate into the ground. Vegetated roofs and green walls also could be used to capture a portion of the rainfall and reduce discharges to the combined sewer system. Stormwater runoff volumes also could be decreased by collecting stormwater runoff in tanks and using it for non-potable purposes such as landscape irrigation, toilet and urinal flushing under the San Francisco Non-Potable Water Program, or for landscape irrigation.

The Stormwater Control Plan prepared for each development project in accordance with the Stormwater Management Requirements and Design Guidelines would describe BMPs that would be implemented to achieve the specified reduction in stormwater flow rates and volumes as well as a plan for post-construction operation and maintenance of the BMPs. The plan must be

reviewed and approved by the SFPUC to certify compliance with the Stormwater Management Requirements and Design Guidelines, and the SFPUC would inspect stormwater BMPs once they are constructed to confirm that they perform as designed.

Under Option 3, future development projects that discharge to the combined sewer system would not be subject to the reductions in stormwater runoff volumes and rates specified in the Stormwater Management Requirements and Design Guidelines, because the overall reduction in stormwater flows would be achieved by diverting a portion of the stormwater from the project site to the separate stormwater system that would be constructed as part of the project under this option. All wastewater and stormwater discharges to the combined sewer system would be treated at the SEWPCP and Bayside wet-weather facilities in compliance with the Bayside NPDES permit for discharges from the SEWPCP, North Point Wet Weather Facility, and all of the Bayside wet-weather facilities. Therefore, project-related discharges to the combined sewer system during operation under all three options would not cause a violation of water quality standards or WDRs and would not otherwise substantially degrade water quality. This impact would be less than significant for discharges to the combined sewer system, and no mitigation is necessary.

Discharges to a Separate Stormwater System

Under Option 2, Separate Wastewater and Stormwater Systems, and Option 3, Hybrid System, future development projects would discharge stormwater to new separate stormwater systems constructed under the Proposed Project, as discussed in Chapter 2, Project Description, pp. 2.61-2.66. Runoff from the project site could entrain common urban stormwater pollutants such as animal waste, litter, metals, oil and grease, and other potential pollutants. However, these discharges would not violate water quality standards or otherwise degrade water quality because all discharges would be in accordance with City regulatory requirements that have been developed to ensure compliance with the Small MS4 General Stormwater Permit.

Stormwater runoff from the project site to the separate stormwater system would be managed in accordance with Article 4.2 of the San Francisco Public Works Code, Section 147, and the Stormwater Management Requirements and Design Guidelines. These requirements apply to individual projects that create or replace 5,000 square feet or more of impervious surfaces. Small Projects (between 2,500 and 5,000 square feet) that discharge to a separate stormwater system must implement one or more Site Design Measure(s) (e.g., tree planting and preservation, permeable pavement, green roofs, vegetated swales, rainwater harvesting, etc.). Large Projects that create and/or replace 5,000 square feet or more of impervious surfaces must implement source controls and BMPs to meet performance requirements. Large Projects located on Port property must manage runoff from the 85th percentile, 24-hour storm. Large Projects within the

Hoedown Yard would be under SFPUC jurisdiction and must manage runoff from the 90th percentile, 24-hour storm.

The Stormwater Control Plan prepared for each development project in accordance with the Stormwater Management Requirements and Design Guidelines would describe BMPs that would be implemented to achieve the specified stormwater treatment as well as a plan for post-construction operation and maintenance of the BMPs. The plan must be reviewed and approved by the Port and/or SFPUC to certify compliance with the Stormwater Design Guidelines, and the Port and/or SFPUC would inspect stormwater BMPs once they are constructed to confirm that they perform as designed.

Article 4.2 of the San Francisco Public Works Code, Section 147, and the Stormwater Management Requirements and Design Guidelines implement the stormwater treatment requirements of the Small MS4 General Stormwater Permit. Therefore, project-related stormwater discharges to the separate stormwater system that would be constructed under Options 2 and 3 would not cause a violation of water quality standards or WDRs and would not otherwise substantially degrade water quality. This impact would be less than significant for discharges to the separate stormwater system, and no mitigation is necessary.

Water Quality Effects Related to Exceeding the Capacity of the Stormwater System

None of the three stormwater management options would result in stormwater runoff that would exceed the capacity of the stormwater conveyance system because, as described in Section 4.K, Utilities and Service Systems, pp. 4.K.24-4.K.25, the new stormwater systems would be constructed in accordance with the City Subdivision Regulations. Accordingly, the new separate stormwater system and components of the combined sewer system would be sized to accommodate the 5-year storm, and flows for the 100-year storm would be directed to San Francisco Bay via streets and other approved corridors that would be designed to accommodate 100-year flood flows in excess of the 5-year storm in accordance with the subdivision regulations. Therefore, water quality effects related to exceeding the capacity of the stormwater system would be less than significant, and no mitigation is necessary.

While compliance with the specified design criteria for sizing of the stormwater infrastructure would ensure that the stormwater flows to the combined system would be within the capacity of the new infrastructure, increases in wastewater flows to the City's combined sewer system could potentially increase the number of combined sewer discharges from the 20th Street sub-basin and downstream basins. This would not constitute an exceedance of the stormwater system capacity, but could result in a violation of the Bayside NPDES permit requirements. The potential for this to occur is addressed in this impact analysis under the subheading "Water Quality Effects Related to Changes in Combined Sewer Discharges," below.

Water Quality Effects Related to Additional Sources of Polluted Runoff

Option 1, Combined Sewer System, and Option 3, Hybrid System, would both involve discharges of stormwater to the City's combined sewer system. Option 2, Separate Wastewater and Stormwater Systems, and Option 3 would both involve discharges of stormwater to the separate stormwater system that would be built for the Proposed Project. However, these discharges would not provide an additional source of stormwater pollutants, because all discharges would be in accordance with Article 4.2, Section 147 of the San Francisco Public Works Code and Stormwater Management Requirements and Design Guidelines that have been developed to ensure compliance with the Bayside NPDES permit and the Small MS4 General Stormwater Permit.

Implementation of source control BMPs for all developments constructed under the Proposed Project would reduce potential pollutant loads in the stormwater runoff and would improve the quality of the runoff to the combined sewer system or separate stormwater system. Source control measures described in the Stormwater Management Requirements and Design Guidelines include covering and hydraulically isolating pollutant generating activities, implementing maintenance activities such as regular sweeping of exposed areas, and using non-polluting building and maintenance materials. Treatment BMPs would further reduce pollutant loads in stormwater via infiltration (e.g., permeable pavement or infiltration basins or trenches), bioretention (e.g., flow through planter or rain garden), or biofiltration (e.g., vegetated areas; media, sand, or vegetated rock filters; use of swirl separators, water quality inlets, or drain inserts). One or more treatment BMPs would be required to address each of the potential stormwater pollutants of concern.

Development projects implemented under the Proposed Project would primarily use two Low Impact Development approaches for treating stormwater discharges: (1) maximizing the amount of pervious area by adding traditional landscaping, vegetated roofs, flow through planters, or permeable pavement; and (2) reuse of stormwater for non-potable uses such as irrigation and toilet flushing.[62] Although infiltration of stormwater is also an allowable method of stormwater management, it is unlikely that infiltration is a feasible approach for the project site because of the presence of shallow bedrock and Bay Mud. However, selection of the appropriate BMPs would be guided by existing site conditions, design and development goals, and the pollutants of concern at the site.

With implementation of the source control and treatment BMPs in accordance with Article 4.2 of the San Francisco Public Works Code, Part 147, the Proposed Project would not provide an

[62] BKF, Pier 70 – Conceptual Stormwater Management Description, April 15, 2015.

additional source of stormwater pollutants, and this impact would be less than significant. No mitigation is necessary.

Water Quality Effects Related to Changes in Combined Sewer Discharges

The project site is located within the 20th Street sub-basin of the City's combined sewer system. When the wet-weather capacity of the 20th Street Pump Station is exceeded, a portion of the wet-weather flows within this sub-basin is stored in the 54-inch and 42-inch storage and detention lines. Flows to the combined sewer system that exceed the pump station capacity and storage capacity of the storage and detention lines are discharged to the Central Basin of Lower San Francisco Bay via the 20th and 22nd streets CSD structures.[63] The Bayside NPDES permit requires that the wet-weather facilities within this sub-basin be designed for a long-term average of no more than 10 CSD events per year. The permit allows for this annual average to be exceeded in any particular year as long as the long-term average is maintained at the appropriate level. However, a permanent increase in wastewater flows could affect the ability to maintain the long-term average of no more than 10 CSD events, potentially resulting in a violation of the NPDES permit, a significant water quality impact. This impact is discussed in relation to each of the wastewater and stormwater management options below.

Option 1: Combined Sewer System

Under Option 1, Combined Sewer System, both wastewater and stormwater from the project site would be conveyed to the new 20th Street Pump Station (described under "Common Improvements" in Chapter 2, Project Description, pp. 2.59-2.61) for ultimate conveyance to the SEWPCP via the City's combined sewer system. Stormwater flows in the sub-basin would be reduced by up to 25 percent relative to existing conditions as required by Article 4.2 of the San Francisco Public Works Code, Section 147, and the Stormwater Management Requirements and Design Guidelines. However, without sufficient pumping capacity, the new pump station could cause the frequency of CSDs from the 20th Street sub-basin and/or downstream basins to increase beyond the long-term average of 10 CSD events per year, in violation of the Bayside NPDES permit. This would constitute a significant impact. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HY-2a: Design and Construction of Proposed Pump Station for Options 1 and 3, which specifies performance standards for the pump station. With achievement of these performance standards, wastewater and stormwater discharges would not exceed the long-term average of 10 CSD events specified in the Bayside NPDES permit.

[63] San Francisco Bay RWQCB, Order No. R2-2013-0029, NPDES No. CA0037664, Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities, and Wastewater Collection System, August 19, 2013, p. 24.

Mitigation Measure M-HY-2a: Design and Construction of Proposed Pump Station for Options 1 and 3

The project sponsors shall design the new pump station proposed as part of the Proposed Project to achieve the following performance criteria.

- The dry-weather capacity of the new pump station and associated force main shall be sufficient to convey dry-weather wastewater flows within the 20th Street sub-basin, including flows from the existing baseline, the Proposed Project at full build-out, and cumulative project contributions; and
- The wet-weather capacity of the new pump station shall be sufficient to ensure that potential wet-weather combined sewer discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average of ten discharges per year specified in the SFPUC Bayside NPDES permit or applicable corresponding permit condition at time of final design. The capacity shall be based on the existing baseline, the Proposed Project at full build-out, and cumulative project contributions,

The project sponsors shall coordinate with the SFPUC regarding the design and construction of the pump station. The final design shall be subject to approval by the SFPUC.

Option 2: Separate Wastewater and Stormwater Systems

Under Option 2, Separate Wastewater and Stormwater Systems, wastewater from the project site would continue to be conveyed to the City's combined sewer system for treatment at the SEWPCP. A new separate stormwater system would also be constructed to convey stormwater flows to a new outfall located near the foot of the realigned 21st Street. This option would eliminate all stormwater flows from the project site to the combined sewer system, although stormwater flows from the 20th Street Historic Core site and BAE Systems Ship Repair facility to the north of 20th Street would continue to discharge to the combined sewer system. The analysis below addresses the potential effects of changes in wastewater and stormwater discharges to the combined system on the frequency and composition of CSDs from the 20th Street sub-basin. The water quality effects of stormwater discharges from the separate system are discussed above under the heading "Water Quality Effects Related to Exceedance of Water Quality Criteria and Waste Discharge Requirements."

Under this option, wet-weather discharges to the new pump station would consist of wastewater from the entire sub-basin, and stormwater from the 20th Street Historic Core and BAE Systems site. Because of the elimination of stormwater discharges from the project site and the addition of wastewater discharges from the project site to the new 20th Street Pump Station, future combined sewer discharges would consist of a much larger portion of sanitary sewage and industrial wastewater relative to existing conditions. The Bayside NPDES permit (pp. 16 and 17) includes collection system management requirements that require the combined sewer system to be operated in a manner that does not result in a release of untreated or partially treated wastewater.

Therefore, this option could result in a violation of the Bayside NPDES permit without appropriate design of the proposed pump station. This would constitute a significant impact. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HY-2b: Design and Construction of Proposed Pump Station for Option 2, which specifies performance standards for the pump station. With achievement of these performance standards, wastewater and stormwater discharges would not exceed the CSD limitations of the Bayside NPDES permit, and water quality impacts related to changes in combined sewer overflows would be less than significant.

Mitigation Measure M-HY-2b: Design and Construction of Proposed Pump Station for Option 2

The project sponsors shall design the new pump station proposed as part of the Proposed Project to achieve the following performance criteria.

- The dry-weather capacity of the new pump station and associated force main shall be sufficient to convey dry-weather wastewater flows within the 20th Street sub-basin, including flows from the existing baseline, the Proposed Project at full build-out, and cumulative project contributions;
- During wet weather, wastewater flows from the project site shall bypass the wet-weather facilities and be conveyed to the combined sewer system in such a manner that they do not contribute to combined sewer discharges within the 20th Street sub-basin; and
- The wet-weather capacity of the new pump station shall be sufficient to ensure that potential wet-weather combined sewer discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average of ten discharges per year specified in the SFPUC Bayside NPDES permit or applicable corresponding permit condition at time of final design. The capacity shall be based on the existing baseline and cumulative project contributions.

The project sponsor shall coordinate with the SFPUC regarding the design and construction of the pump station. The final design shall be subject to approval by the SFPUC.

Option 3: Hybrid System

Under Option 3, Hybrid System, wastewater from the entire project site and stormwater from the areas of the project site to the west of the proposed Maryland Street would be conveyed to the new pump station for ultimate conveyance to the SEWPCP via the City's combined sewer system. Only the small area to the east of the proposed Maryland Street would be served by a new separate stormwater system that would discharge stormwater to the Central Basin of Lower San Francisco Bay. The required capacity of the new pump station would be less than required under Option 1, because the total flows to the new pump station would be less under this option. However, without sufficient pumping capacity, the new pump station could cause the frequency of CSDs to increase beyond the long-term average of 10 CSD events per year specified in the

Bayside NPDES Permit, a significant impact. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HY-2a, which specifies performance standards for the pump station. With achievement of the performance standards specified in this mitigation measure, wastewater and stormwater discharges would not exceed the CSD limitations of the Bayside NPDES permit, and water quality impacts related to changes in combined sewer overflows would be less than significant.

The water quality effects of stormwater discharges from the separate system are discussed above under the heading "Water Quality Effects Related to Exceedance of Water Quality Criteria and Waste Discharge Requirements."

Water Quality Effects Related to Use of Alternate Water Supply

In accordance with San Francisco's Non-potable Water Ordinance, the Proposed Project would use alternate water sources for non-potable applications such as toilet and urinal flushing as well as irrigation. Available sources of water include rainwater and stormwater, as well as graywater collected from on-site uses. Use of this water would not violate water quality standards because in accordance with the Non-potable Water Ordinance, project sponsors would be required to treat the alternate water supply to water quality criteria specified by the DPH and conduct monitoring to demonstrate compliance with the specified water quality criteria. For each water supply, the Non-potable Water Ordinance includes water quality limits for both bacteria (*Escherichia coli*) and turbidity. If the alternate water supply is disinfected using chlorine, the ordinance also includes water quality limits for residual chlorine.[64] If stormwater is used, the treated water must also meet specified standards for VOCs. If graywater is used, the treated water must also meet specified standards for pH.

Compliance with water quality criteria would be ensured through the permitting process. This process requires the project sponsors submit a water budget application to the SFPUC and an engineering report to the DPH. Based on these documents, the project sponsors would obtain a construction permit from the DBI. After completing a cross connection test, the project sponsors would obtain a permit to operate from the DPH and conduct the required ongoing monitoring, reporting, and inspections. With compliance with these requirements, the quality of the alternate water supply would not exceed water quality criteria, and water quality effects related to use of an alternate water supply would be less than significant. No mitigation is necessary.

[64] San Francisco Department of Public Health, Director's Rules and Regulations for the Operation of Alternate Water Source Systems, December 4, 2015.

Water Quality Effects Related to Littering

The proposed use of the project site for commercial, residential, RALI, and public open space uses could increase the potential for litter, and the adjacent Lower San Francisco Bay is listed as impaired for trash. In accordance with Article 6 of the San Francisco Health Code, Garbage and Refuse, the project sponsors would be required to place containers in appropriate locations for the collection of refuse. In accordance with this article, the refuse containers must be constructed with tight fitting lids or sealed enclosures, and the contents of the container may not extend above the top of the rim. The project sponsors must also have adequate refuse collection service. Further, Article 6 prohibits the dumping of refuse onto any streets or lands within San Francisco.

The Proposed Project would be required to comply with several City ordinances, discussed in Section 4.K, Utilities and Service Systems, which would decrease the amount of non-degradable trash generated under the Proposed Project. The San Francisco Mandatory Recycling and Composting Ordinance requires facilities to separate their refuse into recyclables, compostables, and trash. In addition, the Food Service Waste Reduction Ordinance prohibits any establishment that serves food prepared in San Francisco from using polystyrene foam (Styrofoam) to-go containers. This ordinance also requires that any containers used in the City's programs be either recyclable or compostable.

Further, under Option 2, Separate Wastewater and Stormwater Systems, and Option 3, Hybrid System, the Proposed Project would be required to comply with the Trash Amendment of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, described above under "Inland Surface Waters, Enclosed Bays, and Estuaries Plan," pp. 4.O.30-4.O.31. This amendment would require the Proposed Project to implement specific measures to prevent the transport of trash to San Francisco Bay. Compliance with this requirement may be achieved using a full capture system for all storm drains (Track 1) or a combination of full capture systems, multi-benefit projects, other treatment controls, and institutional controls (Track 2) as described in Regulatory Framework.

Compliance with Article 6 of the San Francisco Health Code, the City ordinances described above, and the Trash Amendment for wastewater and stormwater, Options 2 and 3 would reduce the amount of non-recyclable and non-compostable wastes produced at the project site, would ensure that adequate containers and refuse service are provided, and would ensure that offshore San Francisco Bay water is kept free of trash as a result of littering at the Proposed Project site. This would reduce the potential for transport of litter to the combined or separate stormwater systems and directly to San Francisco Bay via wind or stormwater runoff. Therefore, water quality impacts related to littering would be less than significant, and no mitigation is necessary.

Impact HY-3: The Proposed Project would not substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. ***(Less than Significant)***

The project site is located within the San Francisco Downtown Groundwater Basin. Groundwater in this basin is not considered potable, and the only groundwater extracted from this groundwater basin is for dewatering purposes. Implementation of the Proposed Project would not result in depletion of groundwater resources in the San Francisco Downtown Groundwater Basin because, other than pumping of groundwater during construction dewatering, the project would not involve the use or extraction of groundwater. Rather, potable water for the Proposed Project would be provided via pipe by the SFPUC from the regional water supply system, and non-potable water for the project would be obtained from graywater re-use and/or captured stormwater or rain water during wet weather, in accordance with the City's Non-Potable Water Program. If and when a supply of recycled water becomes available through the Eastside Recycled Water Project,[65] the Proposed Project could also use recycled water for non-potable uses, although the bulk of the non-potable water demand would already be met by on-site sources. Further, the Pier 70 Risk Management Plan, described in Section 4.P, Hazards and Hazardous Materials, pp. 4.P.20-4.P.26, prohibits the use of groundwater throughout the Pier 70 Risk Management Plan Area.

The Proposed Project would replace many existing impervious surfaces and would create some new ones. However, the total amount of impervious surfaces would only increase from approximately 1.34 million square feet (87 percent of the project site) to 1.36 million square feet (88 percent of the project site). Therefore, the Proposed Project would not appreciably decrease groundwater recharge as a result of increased imperious surfaces. Although the Proposed Project could reuse rainwater under the City Non-potable Water Program, rainwater is currently captured in the combined sewer system and conveyed to the SEWPCP. Therefore, the Proposed Project would not decrease the amount of rainwater recharged to the groundwater at the project site.

For the reasons stated above, impacts related to depletion of groundwater resources and interference with groundwater recharge would be less than significant, and no mitigation is necessary.

[65] The SFPUC plans to provide 2 million gallons per day of high-quality recycled water to the customers in the east side of the City through the Eastside Recycled Water Project for non-potable uses such as irrigation and toilet flushing. This project is still in the planning stages, and the implementation date is uncertain.

Impact HY-4: The Proposed Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion, siltation, or flooding on or off site. ***(Less than Significant)***

The project site does not include any existing streams or water courses that could be altered or diverted. Therefore, the Proposed Project would have no impact related to alteration of drainage patterns by altering the course of a stream in a manner that would cause erosion or flooding on- or off-site.

Under the Proposed Project, stormwater would be routed to a new separate stormwater system or the City's combined sewer system. In accordance with the Stormwater Management Requirements and Design Guidelines, stormwater controls for future development projects that discharge to the new separate stormwater system would be designed to treat rainfall from the 85th or 90th percentile, 24-hour storm and include measures to reduce or eliminate downstream water pollution. In areas served by the combined sewer system, Article 4.2 of the San Francisco Public Works Code, Section 147, and the Stormwater Management Requirements and Design Guidelines would require that the stormwater controls for individual development projects reduce or maintain existing stormwater runoff flow rates and volumes. Further, as described in Impact HY-2, the new separate stormwater system and components of the combined sewer system would be sized to accommodate the 5-year storm, and flows for the 100-year storm would be directed to San Francisco Bay via streets and other approved corridors that would be designed to accommodate 100-year flood flows in excess of the 5-year storm in accordance with the subdivision regulations. Compliance with these design requirements, subject to approval by SFPW, would ensure that no on- or off-site flooding, erosion, or siltation would occur.

Therefore, neither alteration of existing drainage patterns at the project site nor changes in stormwater runoff volumes would result in substantial erosion, siltation, or flooding on- or off-site, and this impact would be less than significant. No mitigation is necessary.

Impact HY-5: Operation of the Proposed Project would not place housing within a 100-year flood zone or place structures within an existing 100-year flood zone that would impede or redirect flood flows. ***(Less than Significant)***

The shoreline portions of the project site are located within a 100-year flood zone identified on the City's 2008 Interim Flood Hazard Maps. However, the Proposed Project includes construction of shoreline protection improvements that would repair or improve riprap revetments along the entire waterfront of the project site to protect the waterfront from the damaging effects of wave action. The Proposed Project would also raise the grade of the inland portions of the project site to 15.4 feet NAVD88 (104.0 feet project datum), which is above the existing 100-year flood elevation. The final slopes along the waterfront would be similar to existing conditions.

Factors that could exacerbate flooding issues along the waterfront portion of the project site include changes in the shape and configuration of the shoreline as well as construction of in-bay structures or enclosures such as jetties, breakwaters, or marinas that could change circulation patterns in San Francisco Bay in the vicinity of the project site. Because the final slope and shape of the shoreline along the waterfront portion of the project site would be substantially the same as existing conditions and the Proposed Project does not include the construction of any new in-water structures, the patterns of flood flows at the project site or in the vicinity would not be substantially affected.

In addition, the Proposed Project would raise the grade of the 28-Acre Site and low-lying portions of the Illinois Parcels by adding between 3 and 5 feet of fill which would further reduce the risk of flooding within the inland portions of the project site. Although the Proposed Project includes the construction of housing, any proposed housing and other proposed structures would be constructed more than 100 feet inland from the shoreline and would not be constructed within an identified 100-year flood zone. Therefore, impacts related to placement of housing within a 100-year flood zone and the impedance or redirection of flood flows within an existing 100-year flood zone would be less than significant. No mitigation is necessary.

Impact HY-6: Operation of the Proposed Project would not place structures within a future 100-year flood zone that would impede or redirect flood flows. ***(Less than Significant)***

The existing elevation at the top of the shoreline along the 28-Acre Site and westward to the approximate location of the future Maryland Street is approximately 8.4 to 12.4 feet NAVD88 (97.0 to 101.0 feet project datum). At the existing site grades, over half of the 28-Acre Site could be temporarily flooded to a maximum depth of 2 feet as a result of 36 inches of sea level rise in combination with 100-year storm surge. This is the amount of sea level rise that the NRC projects will occur by the year 2100. The NRC Report concludes that the worst case amount of sea level rise would increase San Francisco Bay water levels by up to 66 inches by the year 2100. In combination with 100-year storm surge, this amount of sea level rise would flood the entire 28-Acre Site to a maximum depth of 5 feet with the current site grade. The flood levels associated with both scenarios are 13 feet NAVD88 (101 feet project datum) and 15 feet NAVD88 (104 feet project datum), respectively. No portion of the Illinois Parcels is within an anticipated future flood zone, even under the worst-case scenario of 66 inches of sea level rise in combination with a 100-year storm surge.

As described under “Shoreline Protection Improvements” in Chapter 2, Project Description, pp. 2.71-2.74, the Proposed Project would raise the grade of the inland portions of the project site to an elevation of 15.4 feet NAVD88 (104.0 feet project datum). Raising the inland grade to this elevation would protect all buildings and immovable facilities such as roadways from flooding

with 66 inches of sea level rise in combination with a 100-year storm surge, which would result in a flood elevation of 15 feet NAVD88, or 104 feet project datum. As for existing conditions, the shoreline would continue to be subject to flooding and wave action as a result of sea level rise. However, the shoreline protection improvements would include construction of repaired or improved riprap revetments along the entire waterfront of the project site to protect the waterfront from the damaging effects of wave action. The final slopes along the waterfront would be similar to existing conditions.

As for existing flooding conditions, factors that could exacerbate flooding and increase the potential for coastal erosion along the waterfront portion of the project site include changes in the shape and configuration of the shoreline as well as construction of in-bay structures or enclosures such as jetties, breakwaters, or marinas that could change circulation patterns in San Francisco Bay at the project site and in the vicinity. Because the final slope and shape of the shoreline along the project waterfront portion of the project site would be substantially the same as existing conditions, and the Proposed Project does not include the construction of any new in-water structures, the patterns of flood flows and potential for coastal erosion at the project site and in the vicinity would not be substantially affected.

The Proposed Project does not include additional stormwater discharges or other discharges that would increase the frequency or severity of flooding and, as discussed above in Impact HY-4, the stormwater drainage systems installed under any of the three wastewater and stormwater options would be sized to adequately convey stormwater flows in accordance with San Francisco's subdivision regulations. The Proposed Project would not cause flooding to occur in areas that would not be subject to flooding without the Proposed Project for the reasons stated above. Therefore, this impact would be less than significant, and no mitigation is necessary.

Impact HY-7: The Proposed Project would not expose people or structures to substantial risk of loss, injury, or death due to inundation by seiche, tsunami, or mudflow. ***(Less than Significant)***

The majority of the 28-Acre Site is located in an area identified for potential inundation in the event of a tsunami or seiche based on existing site grades.[66] The potential tsunami and seiche wave height is approximately 6 feet at the project site.[67] When added to the Mean High Water

[66] California Emergency Management Agency, California Geological Survey, University of Southern California, *Tsunami Inundation Map for Emergency Planning, San Francisco North Quadrangle/San Francisco South Quadrangle (San Francisco Bay)*, June 15, 2009. Available online at http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanFrancisco/Documents/Tsunami_Inundation_SouthSFNorthSF_SFBay_SanFrancisco.pdf. Accessed November 28, 2015.

[67] Moffatt & Nichol, *Tsunami Risk Assessment*, p. 4.

level of 6 feet NAVD88, the maximum tsunami wave height would have an elevation of 12 feet NAVD88, or 100 feet project datum.

Risks to Structures

As discussed in "Shoreline Protection Improvements" in Chapter 2, Project Description, pp. 2.71-2.74, and in Impact HY-6, above, the Proposed Project would include construction of shoreline improvements that would raise the top of the shoreline along the entire waterfront of the 28-Acre Site to an elevation of 15.4 feet NAVD88 (104.0 feet project datum). The project sponsors would also emplace up to 5 feet of imported fill to elevate the interior portions of the 28-Acre Site and low-lying areas of the Illinois Parcels above the projected flood elevation in 2100. Building 12 would be protected from flood waters by intervening elevated portions of the site or raising the existing finished floor, and the finished floor elevations of all other proposed buildings and existing buildings would have a minimum elevation of 15.8 feet NAVD88 (104.4 feet project datum) which would be higher than the estimated tsunami inundation level. Therefore, the Proposed Project would not expose people or structures to substantial risk of loss, injury, or death due to inundation by seiche or tsunami.

Risks to People

In the event of an earthquake capable of producing a seiche or tsunami that could affect San Francisco, the National Warning System, described in the Environmental Setting, would provide warning to the City. The San Francisco outdoor warning system (sirens and loudspeakers, tested each Tuesday at 12:00 noon) would then be initiated, which would sound an alarm alerting the public to tune into local TV, cable TV, or radio stations. These alert messages would carry instructions for appropriate actions to be taken as part of the Emergency Alert System. Police would also canvass the neighborhoods sounding sirens and bullhorns, as well as knocking on doors as needed, to provide emergency instructions. Evacuation centers would be set up if required. The advance warning system would allow for evacuation of people from the public use areas closest to the shoreline prior to a seiche or tsunami and would provide a high level of protection to public safety.

Conclusion

For the reasons discussed above, the Proposed Project would not expose structures or people to substantial risk of loss, injury, or death due to inundation by a seiche or tsunami. Rather, the project would reduce tsunami risks to people and structures by raising the interior grades of the project site well above the projected tsunami level. This impact would be less than significant, and no mitigation is necessary.

Cumulative Impacts

Section 4.A, Approach to Cumulative Impact Analysis and Cumulative Projects, pp. 4.A.12-4.A.18, describes the approach to the cumulative analysis used throughout this EIR and summarizes cumulative projects in the vicinity of the project site.

The geographic scope of potential cumulative impacts on water quality encompasses Lower San Francisco Bay. The geographic scope of effects on drainage and flooding consists of the Bayside Drainage Basin. Impacts related to future flooding as a result of sea level rise and inundation by tsunami could occur along the entire San Francisco Bay waterfront; therefore, the geographical scope for this impact includes the entire waterfront.

Impact C-HY-1: The Proposed Project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not result in a considerable contribution to cumulative impacts on hydrology and water quality. ***(Less than Significant)***

As discussed in Impact HY-1, implementation of appropriate regulatory requirements would ensure that the Proposed Project would result in less than significant impacts related to erosion and discharges of groundwater during dewatering. Other projects that could potentially contribute to a cumulative impact would be subject to the same or similar regulatory requirements including the Construction General NPDES permit, Article 4.1 of the Public Works Code as supplemented by SFPW Order No. 158170, and Article 4.2 of the Public Works Code, Section 146 (including implementation of an erosion control plan). Similarly, all in-bay construction along the waterfront would be required to implement the requirements of Section 404 and Section 10 permits from the Corps that would receive water quality certification from the RWQCB in accordance with Section 401 of the CWA. Implementation of these requirements under each individual project would ensure that all discharges comply with regulatory standards and would not result in a violation of water quality standards. Therefore, cumulative impacts related to these topics would be less than significant, and no mitigation is necessary.

As discussed in Impact HY-2, stormwater discharges to both the new separate stormwater system, if constructed, and the City's combined sewer system would be subject to Article 4.2 of the San Francisco Public Works Code, which would ensure compliance with the Small MS4 General Stormwater Permit and the Bayside NPDES permit. Compliance with these regulatory standards by the Proposed Project and all of the potentially cumulative projects would ensure that stormwater discharges would not result in a violation of water quality standards or provide an additional source of polluted runoff. Therefore, cumulative impacts related to these impacts would be less than significant, and no mitigation is necessary.

Cumulative impacts related to contributions to combined sewer overflows would be potentially significant because, the combined wastewater and stormwater discharges to the new 20th Street Pump Station could cause an increase in the frequency or change in composition of CSDs from the 20th Street sub-basin. However, under all options, the project sponsors would be required by Mitigation Measure M-HY-2a or M-HY-2b, pp. 4.O.60-4.O.61, to design and construct the new 20th Street Pump Station and associated facilities with a sufficient capacity to ensure that project-related and cumulative discharges from the 20th Street sub-basin and associated downstream basins do not exceed the long-term average number of discharges per year specified in the SFPUC Bayside NPDES permit or applicable corresponding permit condition at time of final design. With implementation of these mitigation measures, wastewater and stormwater flow from the project site and the entire 20th Street sub-basin would be managed in accordance with the Bayside NPDES Permit and would not contribute to an increase in CSDs from the combined sewer system. Although the project's contribution to this impact would be cumulatively considerable, the project's contribution would be reduced to a less-than-significant level with implementation of Mitigation Measures M-HY-2a and M-HY-2b.

There would be no cumulative impacts related to exceeding the capacity of the separate stormwater system or providing an additional source of polluted runoff because the separate system would serve the project site only, and would not accept flows from other areas.

As discussed in Impact HY-2, the Proposed Project's water quality impacts related to use of an alternate water supply for non-potable uses would be less than significant through compliance with the City's Non-potable Water Ordinance. Water quality impacts related to use of alternate water supplies are site-specific; therefore, there would be no cumulative water quality impacts related to use of alternate water supplies.

As discussed in Impact HY-2, the Proposed Project's water quality impacts related to littering would be less than significant through compliance with Article 6 of the San Francisco Health Code, City ordinances addressing recycling and composting of wastes, and the Trash Amendment of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Other projects in the area are also required to comply with these requirements. Therefore, cumulative water quality impacts related to litter would be less than significant, and no mitigation is necessary.

As discussed in Impact HY-4, project elements affecting drainage and flooding issues at the project site would be subject to compliance with established guidelines for the separate storm drainage system and/or the combined sewer system, which would ensure that impacts related to alteration of drainage patterns are less than significant. Other past, present, and reasonably foreseeable future projects within the Bayside Drainage Basin would also be subject to these regulations. Therefore, based on the City's established regulations and guidelines for the separate

and combined sewer system, which are designed to serve the City as a whole, cumulative impacts related to alteration of drainage patterns would also be less than significant, and no mitigation is necessary.

As described in Impacts HY-5 and HY-6, the City's Bay shoreline is subject to coastal flooding and will be subject to an increased risk of flooding in the future due to sea level rise. Past, present, and foreseeable future development in such areas could impede or redirect future flood flows. However, as described above, construction of shoreline protection improvements that would raise the top of the shoreline along the entire waterfront portion of the 28-Acre Site to an elevation of 15.4 feet NAVD88 (104.0 feet project datum) and the proposed raising of the elevation of the interior of the site above the upper range of projected 2100 flood elevations would not impede or redirect flood flows. Therefore, the Proposed Project's contribution to cumulative impacts related to existing flooding hazards and future flood hazard risks due to sea level rise would not be cumulatively considerable (i.e., less than significant), and no mitigation is necessary.

As discussed in Impact HY-7, a tsunami or seiche would not adversely affect the project site because the Proposed Project would include construction of shoreline protection improvements that would raise the shoreline along the entire waterfront portion of the 28-Acre Site to an elevation of 15.4 feet NAVD88 (104.0 feet project datum) which is well above the maximum tsunami wave height of 12 feet NAVD88, or 100 feet project datum. San Francisco also has a well-established Tsunami Warning System that would be activated, which would protect people from harm, and the new structures would be constructed in accordance with the current building code, which would make them resilient to damage by tsunamis. Because other projects would be built to current building codes, and the Tsunami Warning System would also protect other people in the project vicinity from harm due to tsunamis, cumulative impacts related to inundation by a tsunami or seiche would be less than significant, and no mitigation is necessary.

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P. HAZARDS AND HAZARDOUS MATERIALS

Section 4.P, Hazards and Hazardous Materials, addresses the potential impacts of the Proposed Project related to hazardous materials during construction and operation of the Proposed Project, including impacts related to the presence of hazardous materials in the soil, soil vapor, and groundwater along with naturally occurring asbestos in the fill materials and bedrock at the site. The existing Risk Management Plan (RMP) for the *Pier 70 Preferred Master Plan* area (which includes the 28-Acre Site and the 20th/Illinois Parcel) and Site Management Plan (SMP) for the Hoedown Yard provide a framework and protocols for the management of hazardous materials in soil and groundwater during development of the 28-Acre Site and the Illinois Parcels. These plans are described in this section, and the impact analyses provide mitigation measures to address human health and environmental risks associated with development of the Proposed Project. Known hazardous building materials in the buildings to be demolished and those to be reused are also identified along with the regulatory requirements that address abatement of these materials. Mitigation measures are provided to ensure the appropriate handling of polychlorinated biphenyl (PCB)-containing electrical transformers at the site, and to address the potential for contamination resulting from leakage. The potential for the proposed development to interfere with an adopted emergency response plan or emergency evacuation plan or result in fire hazards is also addressed. Impacts related to emergency access are addressed in Section 4.E, Transportation and Circulation, pp. 4.E.106-4.E.108.

The *Pier 70 Preferred Master Plan* area includes both the 28-Acre Site and the 20th/Illinois Parcel, and the risk management requirements in the RMP would apply equally to these portions of the project site. The Hoedown Yard is located on property owned by Pacific Gas & Electric Company (PG&E) and the requirements of the SMP for the Hoedown Yard apply to that portion of the project site. Much of the site background discussion is supplemented by information from the Phase I Environmental Site Assessment completed only for the 28-Acre Site and various documents applicable to either the Hoedown Yard or 20th/Illinois Parcel.

ENVIRONMENTAL SETTING

HAZARDOUS MATERIALS AND WASTES DEFINITIONS

A *hazardous material*, defined in Section 25501(n) of the California Health and Safety Code, is a material that, "because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released to the workplace or environment." Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications as well as in residential areas to a limited extent.

A waste is any material that is relinquished, recycled, or inherently waste-like. Title 22 of the California Code of Regulations, Division 4.5, Chapter 11 (Identification and Listing of Hazardous Waste) contains regulations for the classification of hazardous wastes. A waste is considered a *hazardous waste* if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases) in accordance with the criteria established in Article 3 of Chapter 11. Articles 4 and 4.1 also list specific hazardous wastes, and Article 5 identifies specific waste categories, including Federal Resource Conservation and Recovery Act (RCRA) hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, hazardous wastes of concern, and special wastes. If improperly handled and if released to the soil, groundwater, or air (in the form of vapors, fumes, or dust), hazardous materials and wastes can result in public health hazards.

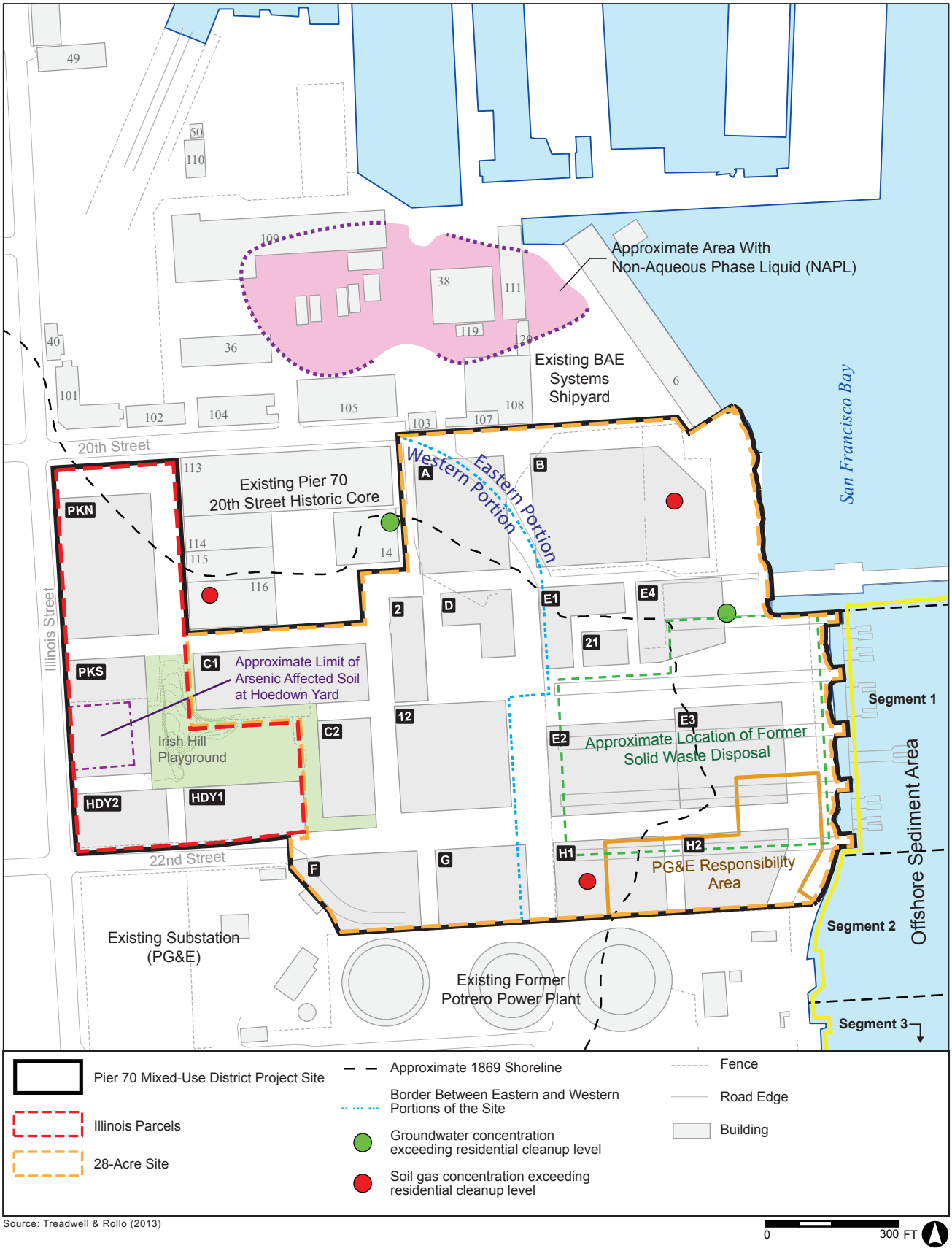
HISTORIC LAND USES

This subsection describes the site history of the 28-Acre Site and the Illinois Parcels, and presents a brief site history of the Potrero Power Plant adjacent to the southern property boundary that was formerly owned by PG&E. Both the 28-Acre Site and the 20th/Illinois Parcel are located within the *Pier 70 Preferred Master Plan* area. Although the 28-Acre Site has been used for a number of industrial and shipbuilding uses, none of these activities have been conducted on the 20th/Illinois Parcel. The Hoedown Yard is owned by PG&E and historically has been used for a number of industrial uses not related to shipbuilding. Historic uses in each of these areas are described in more detail below.

28-Acre Site

The 28-Acre Site is located within the *Pier 70 Preferred Master Plan* area described in the Project Description and includes Parcels 5 through 8 identified in the *Pier 70 Preferred Master Plan*, as well as Central Park Plaza and Slipways Park. The parcel numbers have been revised for the Proposed Project, as indicated in Table 2.2: Proposed Pier 70 Special Use District – Primary Uses by Parcel and Rehabilitated Building, in Chapter 2, Project Description, p. 2.26. Previously known as the San Francisco Yard and the Bethlehem Steel Shipyard, Pier 70 was a nineteenth century shipbuilding and repair facility. Ships built and serviced at Pier 70 served the U.S. Navy from the Spanish American War in the late 1800s through the two World Wars and into the 1970s. The Phase I Environmental Site Assessment (Phase I ESA) prepared for the 28-Acre Site states that the western and eastern portions of the site are separated by the existing 20th Street, extending south to the existing 22nd Street, as shown on Figure 4.P.1: Sample Locations and Areas of Identified Impact. Each portion of the site has different site histories prior to World War II, as described below.[1]

[1] Geosyntec Consultants, *Draft Phase I Environmental Site Assessment, Pier 70 Waterfront Site, San Francisco, California.* November 2011 (hereinafter referred to as "*Pier 70 Phase 1 ESA*").



Source: Treadwell & Rollo (2013)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.P.1: SAMPLE LOCATIONS AND AREAS OF IDENTIFIED IMPACT

Eastern Portion of 28-Acre Site

The eastern portion of the 28-Acre Site has a long history of iron working and shipbuilding. Pacific Rolling Mills first began operation in 1866. This facility produced roll iron from scrap and manufactured iron products; supplies were delivered to the site via ship, including coal and fuel, firebrick and clay for construction, and scrap iron. Around this time, filling of the site began with materials from Irish Hill to level the site and fill in some mudflats areas outside of the historic 1869 shoreline. Foundries, metal shops, piers, storehouses, and wharves were constructed within 2 years.

Risdon Iron & Locomotive Company purchased the mills in 1900. This company removed all of the previous buildings and replaced them with steel-clad structures used for the manufacturing of mining equipment until 1911. Of the newly constructed buildings, only Building 21 remains. The chronology of the change in ownership at this point is inconsistent in historical records. However, it is known that a subsidiary of U.S. Steel Corporation/Union Iron Works operated a U.S. shipbuilding plant referred to as the Risdon Plant on the property during World War I which lasted from 1914 to 1918. Bethlehem Steel leased the plant in 1917 and purchased it in 1934. After World War I, shipbuilding continued, but at a slower pace. Modernization of the plant began in the late 1930s in anticipation of World War II.

Western Portion of 28-Acre Site

Union Iron Works, a shipbuilding facility, moved to the western portion of the 28-Acre Site in 1884, and portions of the facility extended north of 20th Street, beyond the project site boundaries. The fabrication yard, used for construction of ship hulls, was located partially within the 28-Acre Site and also extended beyond the project site to the north. The pattern shop was located within the project site while the machine, erecting, and smith shops were located to the north. The area to the north of 20th Street, outside of the project site, included the machine shop where engines, boilers, and hardware were built and repaired. Buildings 113 and 114 of the 20th Street Historic Core site (adjacent to the project site) were part of the original complex, but no other buildings from the facility remain.

Entire 28-Acre Site

During World War II (1939 to 1945), Union Iron Works, Bethlehem Steel, and the U.S. Navy operated a public/private partnership for shipbuilding on the merged eastern and western portions of the project site. The Building 12 complex, including Buildings 12, 15, 16, 25, and 32, was constructed in 1941 and comprised the central facilities supporting hull construction at Slipways 5 through 8. Building 66 was built in 1945 and used as a welding shed where hull

components were welded. With the exception of Building 21, all of the remaining buildings within the 28-Acre Site were built to support these shipbuilding activities.

Shipbuilding operations declined after World War II, with only a brief increase in production in the mid-1950s. The last ship manufactured at Pier 70 was delivered in 1965. Since that time, the project site was used for making the large steel tubes for the Bay Area Rapid Transit's (BART's) Transbay Tube in 1967 and for building large barges until the 1970s. The City assumed ownership of Pier 70 in 1982.

The Phase I ESA notes that the Sims Metals area to the east of the Radio Tower lot in the northeastern corner of the 28-Acre Site was used for oil storage between 1914 and 1950.[2] In 1900, there was also an 8,000-gallon crude oil tank located near the slipways.[3] There was also oil storage adjacent to the previous location of Building 112.[4] Numerous old utility systems remain in place, including underground oil and gas lines associated with historic land uses as well as abandoned fuel and steam distribution lines.[5]

The Phase I ESA notes that Building 116, outside of the 28-Acre Site, was used for ordnance repair, and Building 14 housed a gun test base.[6] Extensive subsurface investigation has been conducted at the 28-Acre Site and no evidence of unexploded ordnance or munitions debris has been detected.

In 2011, concrete debris was present in the Radio Tower lot in the northern portion of the 28-Acre Site, and construction materials and old parts and equipment were present in the Courtyard area, immediately south of the 20th Street Historic Core.[7] The Sims Metals area had scrap metal in large piles for recycling. However, the Phase I ESA did not note any evidence of uncontrolled dumping, stains or other signs of spills, stressed vegetation, or on-site waste disposal within the 28-Acre Site.

Historic Building Uses in 28-Acre Site

Historic uses of buildings within the 28-Acre Site are summarized in Table 1 of the Phase I ESA, which is included in Appendix F, Hazards and Hazardous Materials. Many of these buildings have been removed. The historic uses of buildings remaining within the 28-Acre Site (shown on Figure 2.2: Existing Site Plan, in Chapter 2, Project Description, p. 2.11) are as follows.

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[2] Geosyntec Consultants, *Pier 70 Phase I ESA*, Table 1, p. 5 of 23.
[3] Geosyntec Consultants, *Pier 70 Phase I ESA*, Table 1, p. 6 of 23.
[4] Geosyntec Consultants, *Pier 70 Phase I ESA*, Table 1, p.11 of 23.
[5] Geosyntec Consultants, *Pier 70 Phase I ESA*, p. 69.
[6] Geosyntec Consultants, *Pier 70 Phase I ESA*, p. 68.
[7] Geosyntec Consultants, *Pier 70 Phase I ESA*, p. 37.

- Building 2, built 1941 and 1944, was used to support hull construction at the Building 12 complex during World War II. Around 2011 the Port disposed of drums of hazardous waste previously stored in this building.
- Building 11, built in 1941 as part of the U.S. Navy shipyard, was used to support hull construction at the Building 12 complex in the western portion of the 28-Acre Site.
- Building 12, built in 1941, was the central building of the shipbuilding yard and included a plate shop and mold loft. Leaking transformers containing PCBs were removed from the building in 1981. The Phase I ESA noted that one PCB-containing transformer remains in a utility room of the building.
- Building 15, built in 1944, was used for intermediate staging of steel plates used for hull construction. The Phase I ESA noted large burning tables in this building in 1944. The building also was used to store oily waste drums in 2011.
- Building 16, built in 1941, was the stress relief building. Stress release involved modifying steel joints by heating them, inserting a strong back, and re-welding the joint. This building had two furnaces, at least one of which is still present, and two preheat rooms.
- Building 19, built in 1941 as part of the U.S. Navy shipyard, has been used as a garage and bus maintenance and storage area. The Phase I ESA noted that the building includes a sifter/conveyor for grit used to sandblast ships prior to painting. Previous environmental site assessments noted that sandblast waste had been processed in this building, and was considered a hazardous waste based on copper concentrations. PCB-containing transformers were also stored in this building.
- Building 21, built around 1900 as part of the Risdon Iron & Locomotive Works and Pacific Rolling Mills Company building, housed a machine shop and transformer house, and these or similar uses continued through at least 1945. The Phase I ESA notes that forges were used in this building around 1900. In 2001, the east wing of the building was used for furniture manufacturing. This building is currently the electrical substation for the 28-Acre Site.
- Building 25, built in 1941, was used as a washroom and locker room.
- Building 32, built in 1941, was used to store wooden templates used in shaping steel hull plates.
- Building 66, built in 1945, was used for welding preassemblies and other hull components. This facility included small aboveground storage tanks.
- Building 117, built in 1937 and 1941, was used as a warehouse, and was constructed in the location of a former coke pile. San Francisco Drydock Corporation used this building as a sandblast pit.[8] The Port proposed to demolish the 30,940-gross-square-foot (gsf)

[8] Geosyntec Consultants, *Pier 70 Phase I ESA*, p. 47.

Building 117, located on the project site, prior to commencement of the Proposed Project.[9]

Illinois Parcels

20th/Illinois Parcel

The 20th/Illinois Parcel is also a part of the *Pier 70 Preferred Master Plan* Area described in the Project Description, and includes Parcel 3 identified in the *Pier 70 Preferred Master Plan*. The 20th/Illinois Parcel was not historically used for industrial or shipbuilding purposes. Union Iron Works used this parcel for residential lodging in 1900 and Bethlehem Steel Corporation subsequently used this area for offices in 1950.[10] Since 1987, this parcel has been used for parking by Todd Shipyard, Southwest Marine, and San Francisco Drydock Corporation. The Port currently uses this area for paid parking, construction lay-down, and other temporary purposes such as temporary retail activities including a beer garden, food trucks, and food carts, and a variety of cultural, educational, and recreational activities, including special events.

Hoedown Yard

The 3-acre Hoedown Yard is currently owned by PG&E and was a part of the former Potrero Power Plant adjacent to the southern and western boundaries of the 28-Acre site. Two parcels, the western and eastern parcels, comprise the Hoedown Yard. The eastern parcel was filled in the 1800s and 1900s. In some areas, the fill includes clasts of serpentinite bedrock, which commonly contains naturally occurring asbestos.[11]

The Hoedown Yard has been occupied since about 1886, when it was used for horse stables.[12] Historic industrial operations at the site began around 1910 and initially included operation of aboveground fuel storage tanks in the southern portion of the western parcel. The tanks were constructed on concrete slabs which may still be present beneath the ground surface and their capacities ranged from 30,000 to 40,000 barrels. The storage facility also included an oil heater house and associated aboveground pipelines that ran adjacent to the western perimeter of the

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[9] Building 117 is proposed for demolition as part of the 20th Street Historic Core project to allow the adjacent building (Building 116) located on the 20th Street Historic Core site to be rehabilitated to meet fire code. The Port filed an application to demolish Building 117 on January 7, 2016, Case No. 2016-000346ENV. Any approval of the demolition of Building 117 will undergo appropriate environmental review, as required by CEQA. San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

[10] Treadwell & Rollo, *Feasibility Study and Remedial Action Work Plan, Pier 70 Master Plan Area, San Francisco, California*, May 2012 (hereinafter "*Feasibility Study and Remedial Action Work Plan*"), Table 1.

[11] AMEC, *Site Management Plan, Hoe Down Yard, 22nd Street and Illinois Street, San Francisco, California*, June 22, 2012 (hereinafter "*Hoe Down Yard Site Management Plan*"), p. 3.

[12] AMEC, *Hoe Down Yard Site Management Plan*, p. 2.

Hoedown Yard between the aboveground storage tanks and the oil heater house. The aboveground storage tanks and associated piping were removed by 1996.

PG&E currently uses the western parcel of the Hoedown Yard for vehicle parking and equipment storage and the eastern parcel for temporary stockpiling of materials generated from subsurface utility maintenance operations in San Francisco, including broken concrete slabs as well as mixed soil, sand, gravel, and asphalt. PG&E uses a portion of the western parcel as a settling area for drilling mud (a mixture of bentonite and water) that has been used by PG&E crews for off-site utility work. The drilling mud is periodically disposed of off-site as a non-hazardous waste.

Potrero Power Plant

Before natural gas drilling and recovery technology became widespread, manufactured gas plants used coal and oil to produce gas for lighting, heating, and cooking. The San Francisco Gas Company operated a manufactured gas plant on the Potrero Power Plant property, immediately south of the 28-Acre Site, from 1872 until to 1911.[13] PG&E took ownership of the manufactured gas plant and operated it until approximately 1930. The manufactured gas plant was dismantled in the early 1960s. Historical operations in other areas of the Potrero Power Plant include sugar refining (1870s through 1950s) and barrel manufacturing (1880s through early 1900s) in the southern and western portions of the Potrero Power Plant property, respectively. Additionally, a former steam turbine electric generation facility operated from approximately 1910 through the 1970s in the south-central portion of the Potrero Power Plant property. These historical uses burned coal, coke, and oil to generate power.

PG&E sold the power plant property in 1999 and Southern Company (subsequently, Mirant Corporation and now NRG Potrero LLC) operated the power plant until 2011 when the Trans Bay Cable electric transmission project was built, bringing electricity across the Bay from Pittsburg to San Francisco.[14] The Potrero Power Plant property (now owned by NRG Potrero LLC) houses the infrastructure of the former power plant operations, consisting of one natural gas-fired electric generating unit and three diesel fuel-fired peaker units. None of the units are currently in operation and the peaker units have been removed from the property. Three aboveground storage tanks located less than 50 feet south of 22nd Street and the southern boundary of the 28-Acre Site have historically supplied back-up fuel oil and diesel fuel for the power generation units. The PG&E property to the south of the Hoedown Yard is referred to as the switchyard/general construction area.[15] This area is used for construction staging and power transmission equipment and is not a part of the Potrero Power Plant.

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[13] AMEC, *Report of Results: Phase III Subsurface Investigation, Pier 70 Property*, August 2011, p. 5.
[14] PG&E, "*Potrero Power Plan*t." Available online at http://www.pge.com/en/about/environment/taking-responsibility/mgp/Potrero/site-overview/index.page. Accessed December 4, 2015.
[15] AMEC, *Hoe Down Yard Site Management Pla*n, p. 2.

NATURALLY OCCURRING ASBESTOS

In 1986, the California Air Resources Board (CARB) identified naturally occurring asbestos, which is present in many parts of California, as a Toxic Air Contaminant (TAC). Naturally occurring asbestos is commonly associated with serpentine[16] and ultramafic[17] rock types such as serpentinite of the Franciscan Complex. Serpentinite rock is apple green, brown, reddish brown, and gray to black and has a waxy or shiny appearance. The usual appearance of serpentine is fine grain and compact, but it can be flaky or fibrous. Chrysotile asbestos (a form of asbestos from the serpentine mineral group) and amphibole asbestos (including tremolite) are naturally occurring asbestos minerals that may present a human health hazard if they become airborne and are inhaled.

As discussed in Section 4.N, Geology and Soils, the historic 1869 shoreline crossed the project area south of 20th Street and north of the Hoedown Yard, which is shown on Figure 4.N.1: Project Site Vicinity Geologic Map, p. 4.N.3. Extensive blasting and quarrying of Potrero Point and Irish Hill during the late 1800s and early 1900s nearly leveled Irish Hill, which is composed of serpentinite bedrock of the Franciscan Complex. The resultant rock was placed in the tidal areas to extend and develop the shoreline toward the east, including a substantial portion of the 28-Acre Site and the northeast portion of the Illinois Parcels. Environmental investigations of the sites, described below, have confirmed that the fill material contains naturally occurring asbestos. Some occurrences of serpentine and ultramafic rock are also known to have potentially elevated concentrations of naturally occurring metals such as arsenic, cobalt, copper, chromium (including hexavalent chromium), and nickel.[18]

REGULATORY DATABASE REVIEW

The Phase I ESA describes the regulatory database review that was conducted in 2011 to identify current or previous reports of hazardous materials use, storage, and/or unauthorized releases that may have impacted the 28-Acre Site.[19] As summarized in that document, the *Pier 70 Preferred Master Plan* area, which includes the 28-Acre Site and 20th/Illinois Parcel, was identified in the Spills, Leaks, Investigation and Cleanup (SLIC) database maintained by the San Francisco Bay

[16] Serpentinite is a rock consisting of one or more serpentine minerals formed when ultramafic rocks have been metamorphosed (ultramafic rocks formed in high-temperature environments well below the surface of the earth), and is commonly associated with ultramafic rock along faults such as the San Andreas fault. Serpentinite commonly contains chrysotile, an asbestiform variety of the serpentine minerals. Amphibole asbestos is also found in some forms of Franciscan Complex bedrock such as blueschist.

[17] Ultramafic rocks are one type of igneous rock (formed at high temperatures well below the surface of the earth) that is rich in iron and magnesium.

[18] Wilke, Wolfgang, *Small-Scale Variability of Metal Concentrations in Soil Leachates.* Soil Science Society of America Journal 64, 2000: pp. 138-143.

[19] Geosyntec, *Pier 70 Phase 1 ESA*, pp. 40-44.

Regional Water Quality Control Board (RWQCB), indicating that groundwater contamination has occurred. The 28-Acre Site in the *Pier 70 Preferred Master Plan* area includes two former businesses: Sims Metals and Auto Return. These and adjacent sites were also identified in several other regulatory databases. The environmental database review completed for the Phase I ESA indicates that the PG&E Potrero Plant, including the Hoedown Yard, is identified in the Voluntary Cleanup Program database maintained by the California Department of Toxic Substances Control (DTSC), indicating that the site represents a low threat to the environment, and that PG&E has agreed to regulatory oversight by the DTSC.[20]

PREVIOUS UNDERGROUND TANK REMOVALS AND CLEANUP ACTIVITIES

A number of historic land uses within the 28-Acre Site previously used underground storage tanks (USTs) to store petroleum products. The Phase I ESA for the 28-Acre Site identified the following historic USTs that have been removed:

- Two USTs were removed from an area south of Building 19, and east of Building 113 in 1990.[21] The USTs were a maximum of 5,000 gallons each and were used to store diesel and gasoline. Soil sampling conducted during the UST removal detected total petroleum hydrocarbons (TPH) gasoline at a maximum concentration of 710 milligrams per kilogram (mg/kg); TPH diesel at a maximum concentration of 5,600 mg/kg; and benzene, toluene, ethylbenzene, and xylenes (BTEX) at a maximum concentration of 2,690 mg/kg. Groundwater sampling detected TPH gasoline at a maximum concentration of 2.7 milligrams per liter (mg/L), TPH diesel at a maximum concentration of 1,600 mg/L, and BTEX at a maximum concentration of 0.152 mg/L. A 1991 letter from the Port indicated that this soil would be removed and disposed of offsite when the San Francisco Public Utilities Commission (SFPUC) constructed modifications to the combined sewer system along Mariposa and 20th streets. Based on San Francisco Department of Public Health (DPH) records, free product[22] was observed in the UST excavation at the tank removal.[23] Two 1,000-gallon heating oil USTs were also removed from this location in 1988.
- Four USTs were reportedly located between Buildings 117 and 116.[24] The Phase I ESA did not find details regarding their size or contents; however, a 1990 inspection worksheet from DPH indicates that 5,000-gallon and 2,500-gallon USTs were removed. The inspector noted odor and discoloration of the soil as well as petroleum sheen on the groundwater. Files reviewed for the Phase I ESA also included an application filed in 1992 for in-place closure of a 2,160-gallon UST and a 576-gallon UST near Building 117. The figure attached to the application identifies the two USTs as "sumps."

[20] Environmental Data Resources, Pier 70, 20th Street/Illinois Street, San Francisco, CA 94107. Inquiry Number 3149453.2s, August 18, 2011.
[21] Geosyntec Consultants, *Pier 70 Phase I ESA*, p. 18.
[22] Most fuels such as gasoline and diesel are not soluble in water and do not readily mix with water. When released to the groundwater, they will float on top of the groundwater surface. When this occurs, the floating fuels are referred to as free product.
[23] Geosyntec Consultants, *Pier 70 Phase I ESA*, p. 46.
[24] Geosyntec Consultants, *Pier 70 Phase I ESA*, p. 19.

Soil samples collected by coring through the bottom of the sumps did not contain detectable levels of any constituents not associated with potential laboratory contamination.

- Two boiler fuel USTs previously located immediately east of Building 113 in the 20th Street Historic Core and adjacent to the 28-Acre Site were removed in 1988.[25] Soil sampling conducted during the UST removal detected TPH at a maximum concentration of 600 mg/kg and oil and grease at a maximum concentration of 46,020 mg/kg. Groundwater sampling adjacent to the UST excavation detected TPH gasoline at a maximum concentration of 0.43 mg/L, TPH diesel at a maximum concentration of 41 mg/L, toluene at a maximum concentration of 0.00069 mg/L, and xylenes at a total concentration of 0.0088 mg/L. DPH issued a no further action letter regarding the closure of these USTs in 2000. A subsequent site assessment identified arsenic in three soil samples at a maximum concentration of 448 mg/kg.[26]

No historic USTs have been identified within the 20th/Illinois Parcel.[27]

In 2000 and 2002, approximately 550 tons of soil from the Pick Your Part and City Tow lease area, which included Buildings 12 and 15, parking lots to the east and west, and the area overlying Slipway 8, was disposed of offsite.[28] The excavations were conducted to remove stained surface soil and deeper soil containing TPH diesel, TPH motor oil, and benzo(a)pyrene. In 2004, an approximately 20- by 20-foot and 7-foot-deep area was excavated to remove soil containing TPH gasoline and BTEX.

HAZARDOUS MATERIALS IN SOIL AND GROUNDWATER

Hazardous materials have been identified in the soil and groundwater at both the 28-Acre Site and the Illinois Parcels as a result of previous site uses that involved the use of hazardous materials. Naturally occurring asbestos is also present in the fill materials derived from Irish Hill that were used to fill substantial portions of the 28-Acre Site and Illinois Parcels. As discussed below, the extent of these materials has been extensively evaluated. An RMP and associated deed restriction have been prepared for the *Pier 70 Preferred Master Plan* area which includes the 28-Acre Site and the 20th/Illinois Parcel, and a SMP and associated deed restriction have been prepared for the Hoedown Yard. Collectively, these plans specify procedures for the safe handling of soil and groundwater during construction at the 28-Acre Site, the 20th/Illinois Parcel, and the Hoedown Yard.

The Pier 70 RMP, which covers the 28-Acre Site and the 20th/Illinois Parcel, also includes measures to ensure that future occupants of the site are not exposed to unacceptable levels of

[25] Geosyntec Consultants, *Pier 70 Phase I ESA*, pp. 16 and 17.
[26] Geosyntec Consultants, *Pier 70 Phase I ESA*, pp. 21 and 22.
[27] Treadwell & Rollo, *Memo to Carol Bach of the Port of San Francisco, UST Reconnaissance*, August 26, 2011, Table 1.
[28] Geosyntec Consultants, *Pier 70 Phase I ESA*, pp. 19 and 20.

hazardous materials. The requirements of the Pier 70 RMP and the Hoedown Yard SMP are described separately below.

28-Acre Site and 20th/Illinois Parcel

Soil, Soil Vapor, and Groundwater Quality

Several soil and groundwater investigations have been conducted throughout the *Pier 70 Preferred Master Plan* area, including the 28-Acre Site and the 20th/Illinois Parcel, between 1989 and 2011. The Feasibility Study/Remedial Action Plan (FS/RAP) completed for the *Pier 70 Preferred Master Plan* area in 2012 analyzed the results from these investigations along with the results of a human health risk assessment (HHRA) and an ecological screening level risk assessment (ESLRA) conducted in 2011 to identify site-specific cleanup levels for the soil and groundwater. Using this information, the FS/RAP evaluated potential remediation alternatives to meet the specified cleanup levels or restrict exposure to chemicals in the soil and groundwater so that human health and ecological risks would not occur.[29] The measures approved in the FS/RAP are implemented through the Pier 70 RMP.

HUMAN-HEALTH RISK-BASED CLEANUP LEVELS

As summarized in the FS/RAP, the HHRA for the *Pier 70 Preferred Master Plan* area evaluated human exposures and health risks associated with both construction and subsequent future land uses to identify areas that require remediation.[30] The HHRA calculated site-specific risk-based target concentrations (RBTCs) for each chemical, which are defined as the concentration of a chemical that can remain in soil, soil gas, or groundwater and still be protective of human health, even if exposure were to occur. The National Contingency Plan (NCP) provides the framework for the Federal government response to hazardous materials releases. In accordance with the NCP, acceptable exposure levels are generally concentration levels that represent an excess lifetime cancer risk of between one in ten thousand and one in 1 million (10^{-4} to 10^{-6}).[31] The RBTCs were conservatively calculated by setting a target cancer risk of 10^{-6} and a non-cancer Hazard Index (HI) of 1.0 for individual chemicals and calculating the corresponding soil, soil gas, and groundwater concentration at which that target is met. RBTCs were developed for commercial workers, residents, and recreational park users for the purpose of establishing cleanup levels for soil, soil gas, and groundwater, depending on the future land use. The RBTCs are primarily referred to as cleanup levels in the remainder of this section, and the adopted cleanup levels are included in Appendix F, Hazards and Hazardous Materials.

[29] Treadwell & Rollo, *Feasibility Study and Remedial Action Plan*.
[30] Treadwell & Rollo, *Pier 70 Feasibility Study and Remedial Action Plan*, pp. 16-18.
[31] The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (U.S. EPA, Code of Federal Regulations, Title 40, Part 300.430[e][2]).

The cleanup levels are chemical concentrations that result in acceptable health risks for the intended land use (in this case, residential, commercial, and recreational) without using controls to eliminate or restrict exposure to hazardous materials left in place. Residential exposure, including exposure of young children, to hazardous materials in the soil could occur for more hours per day over longer periods than would occur for a commercial worker. Therefore, residential cleanup levels (i.e., the amount of a chemical that is allowed to remain in the soil) are lower than commercial cleanup levels, and are the most stringent of the two. Recreational exposures to chemicals in the soil occur over shorter durations and more infrequently; therefore, recreational cleanup levels are typically higher than those for both residential and commercial land uses. If a site is cleaned up to residential cleanup levels, it is considered suitable for all land uses. If it is cleaned up to commercial or recreational cleanup levels, future residential land uses of the site would be restricted. In addition, control measures (referred to as Institutional Controls or Engineering Controls) must be incorporated into a project to ensure that unacceptable exposures do not occur if the approved remediation approach for a site includes leaving soil or groundwater in place with chemical concentrations that exceed cleanup levels.

RBTCs were also developed for construction workers to inform health and safety planning during future construction or maintenance activities, including use of personal protective equipment and Hazardous Waste Operations and Emergency Response (Occupational Safety and Health Administration [OSHA] Standard 1910.120) training requirements for construction workers engaged in earth-disturbing activities during future remediation, construction, and maintenance activities. The RBTCs for construction workers are not intended to be used as cleanup levels.

ECOLOGICAL SCREENING LEVEL RISK ASSESSMENT

The FS/RAP also discussed an ESLRA conducted to identify whether hazardous materials in the soil, soil vapor, and/or groundwater beneath the *Pier 70 Preferred Master Plan* area could pose a potential ecological risk.[32] The ESLRA provided a conservative estimate of potential ecological risks. The ESLRA concluded that the potential exists for unacceptable risk to terrestrial ecological receptors (i.e., wildlife and other animals that could come into contact with the site soil) based on the levels of chemicals present in the soil within the Pier 70 area. Based on the ESLRA, the FS/RAP concluded that no specific response action is needed for groundwater because the chemicals of concern present in the fill are either at low concentrations or are relatively immobile. Therefore, they would not likely pose a low risk to the San Francisco Bay and associated ecological resources.[33]

[32] Treadwell & Rollo, *Pier 70 Feasibility Study and Remedial Action Plan*, p. 16.
[33] Treadwell & Rollo, *Pier 70 Feasibility Study and Remedial Action Plan*, p. 41.

SOIL QUALITY

As summarized in the FS/RAP, soil within the *Pier 70 Preferred Master Plan* area contains naturally occurring metals and naturally occurring asbestos as well as heavy hydrocarbons as is typical of bayshore fill material. Soil throughout the site also contains polycyclic aromatic hydrocarbons (PAHs), metals, and/or TPH at concentrations exceeding residential, commercial, and/or recreational cleanup levels.

Oily residue was observed in the soil from two locations within the 20th Street Historic Core immediately north of the project site.[34] No oily residue was identified in soil samples from the 28-Acre Site or the 20th/Illinois Parcel, except the PG&E Responsibility Area which is described below.

Naturally occurring asbestos concentrations in the fill material used within the Pier 70 area range from less than 1 percent to 2 percent.[35]

PCB concentrations did not exceed residential, commercial, or recreational cleanup levels in any of the soil samples from within the 28-Acre Site or 20th/Illinois Parcel.

GROUNDWATER AND SOIL VAPOR QUALITY

Based on the HHRA completed for the *Pier 70 Preferred Master Plan* area, the concentrations of chemicals detected in groundwater and soil vapor (vapors occurring within the soil, above the groundwater table) in the 28-Acre Site and 20th/Illinois Parcel do not pose a significant health risk under current use or under future use for commercial purposes. However, chemical concentrations exceeded residential cleanup levels in the groundwater or soil vapor at the following three locations, shown on Figure 4.P.1, p. 4.P.3:[36]

- Benzene in groundwater from one location within the proposed Waterfront Promenade, adjacent to proposed Parcel E4 (sampling location SPSB-04).
- Naphthalene in soil vapors from one location within proposed Parcel H1 (sampling location P8SG-01) and one location within proposed Parcel B (sampling location P6SGP-01).

In addition, TPH gasoline exceeded the residential cleanup level in groundwater from one location (sampling location B-01-TT) and benzene exceeded the residential cleanup level in soil vapor at one location (sampling location P4SG-09) within the 20th Street Historic Core immediately

[34] Treadwell & Rollo, *Pier 70 Feasibility Study and Remedial Action Plan*, Figure 6.
[35] Treadwell & Rollo, *Pier 70 Feasibility Study and Remedial Action Plan*, p. 11.
[36] Treadwell & Rollo, *Pier 70 Feasibility Study and Remedial Action Plan*, Tables 8 and 9, and Figures 20 and 21.

adjacent to the project site. It is possible for soil vapors and groundwater to migrate; therefore, conditions within the Historic Core could affect conditions within nearby areas of the project site.

Methane was detected at a maximum concentration of 0.183 percent by volume in temporary soil vapor probes throughout the *Pier 70 Preferred Master Plan* area.[37] This maximum methane level is well below the 1.25 percent by volume criteria for protection of indoor air quality in overlying structures specified in Title 27 of the California Code of Regulations, which is the criterion used by DPH to determine if additional monitoring of methane concentrations or implementation of gas migration controls is required[38] (see discussion of this criterion under "State" in Regulatory Framework, p. 4.P.46).

WASTE CLASSIFICATION

Although the majority of the soil within the *Pier 70 Preferred Master Plan* area would be characterized as non-hazardous for waste disposal purposes, previous sampling has demonstrated that approximately 20 percent of the shallow soil in the upper 10 feet of the *Pier 70 Preferred Master Plan* area exhibits characteristics of California-regulated hazardous waste due to concentrations of total and soluble metals that exceed the total threshold limit concentration (TTLC) or soluble threshold limit concentration (STLC).[39] However, none of the soil analyses found soluble concentrations exceeding criteria for Federally regulated hazardous waste. Soil from depths of 10 feet or more does not exceed criteria for State- or Federally regulated hazardous waste. Criteria applicable to the characterization of hazardous wastes are described below under "State" in Regulatory Framework on p. 4.P.41.

PG&E RESPONSIBILITY AREA

Hydrocarbon-based dense non-aqueous phase liquid[40] (DNAPL) has been identified within some portions of the fill material adjacent to and beneath the pier which forms the edge of the three southernmost slipways in the southern portion of the 28-Acre Site (Parcels H1 and the

[37] Treadwell & Rollo, *Pier 70 Risk Management Plan, Pier 70 Master Plan Area, San Francisco, California*, July 25, 2013 (hereinafter referred to as the "*Pier 70 Risk Management Plan*"), p. 6.

[38] California Regional Water Quality Control Board, Letter to Mr. Scott Nakamura, Cityand County of San Francisco Department of Public Health, *Subject: Clarification of the AB2061 Process, Clarification of the California Integrated Waste Management Board (CIWMB) Letter Dated April 4, 2001, and Development of a Protocol for Management of Methaned, Mission Bay Project Area, City and County of San Francisco*, May 15, 2001.

[39] Treadwell & Rollo, Pier 70 Risk Management Plan, p. 5.

[40] Many common contaminants are liquids that, like oil, are not soluble in water and do not readily mix with water. These are referred to as non-aqueous phase liquids. A dense non-aqueous phase liquid (DNAPL) is a liquid that is denser than water and can sink through the groundwater and accumulate on underlying layers of fine geologic materials such as clay.

southernmost part of the Waterfront Terrace), adjacent to the former Potrero Power Plant.[41] The DNAPL is associated with former manufactured gas plant operations in the northern portion of the power plant property. Site investigations conducted by the Port and PG&E identified two localized areas within the Pier 70 area where the accumulated DNAPL is at least 1 foot thick as well as additional areas of discontinuous DNAPL.[42] The area where DNAPL is present within the 28-Acre Site is referred to as the PG&E Responsibility Area and is shown on Figure 4.P.1, p. 4.P.3.

As approved by the RWQCB on December 27, 2012, PG&E's remediation of the DNAPL area within the 28-Acre Site will include excavating the continuous DNAPL areas at the southernmost slipway to a depth of about 23 feet and backfilling the excavations with clean fill.[43] Durable cover(s), consisting of pavement, hardscape, or clean fill and vegetation over a demarcation layer, will be installed over the excavated and backfilled areas. With future development of the site, concrete slabs, asphalt, or new buildings may also act as a durable cover. Areas of discontinuous DNAPL will remain at the project site and PG&E will prepare an RMP for controlling exposure to chemicals left in place during future use of the PG&E Responsibility Area. The RWQCB has also required a deed restriction be imposed on this property, limiting future land uses. PG&E will conduct long-term groundwater monitoring to monitor for potential off-site migration of chemicals left in place. Some of the concrete structures associated with the slipway may be demolished during excavation of the continuous DNAPL. PG&E anticipates beginning these remediation activities in 2017, prior to development under the Proposed Project.[44] Based on sampling of the in-place soil in 2014, at least a portion of the excavated soil would be considered a California hazardous waste based on soluble concentrations of chromium, nickel, and lead.[45]

FORMER SOLID WASTE DISPOSAL SITE

The Phase I ESA reports that the former slipways were filled with approximately 17,000 cubic yards of debris and soil produced during demolition of many of the original Pier 70 structures.[46]

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[41] Haley & Aldrich, Draft Remedial Action Plan, Northeast Area of the Potrero Power Plant Site and a Portion of the Southeast Area of Pier 70, Potrero Power Plant Site, San Francisco, California. July 7, 2015.

[42] Discontinuous DNAPL refers to DNAPL that is present as isolated droplets adhering to the soil matrix. These isolated droplets are not interconnected and there is no possibility for the DNAPL to flow.

[43] Haley & Aldrich, Report on the Northeast Area of the Former Potrero Power Plant and a Portion of the Southeast Area of Pier 70 Feasibility Study, Potrero Power Plant Site, San Francisco, California. December 20, 2012, Section 5.

[44] Pacific Gas & Electric web site, Potrero Power Plant, Cleanup Areas and Recent Activities. Available online at http://www.pge.com/en/about/environment/taking-responsibility/mgp/Potrero/cleanup-and-activities/index.page. Accessed December 11, 2015.

[45] Haley & Aldrich, Upland Remediation Pre-Design Investigation Report, Northeast Area of the Potrero Power Plant and a Portion of the Southeast Area of Pier 70, Potrero Power Plant Site, San Francisco, California. June 18, 2014, p. 25.

[46] Geosyntec, Pier 70 Phase I ESA, pp. 28 and 29.

The location of this former solid waste disposal site is shown on Figure 4.P.1, p. 4.P.3. The type of wastes placed into this area is not well documented, but the waste is thought to have contained concrete, wood, glass, plastic, and metal along with unspecified amounts of soil. As approved by the RWQCB, the Port capped the fill area with asphaltic concrete pavement in approximately 1970. In 1971, the RWQCB issued Cleanup and Abatement Order No 71-5 and subsequently issued waste discharge requirements (WDRs), Order No. 87-060, for the former Pier 70 solid waste disposal area in 1987. The WDRs specified the necessary actions to investigate, mitigate, and monitor potential water quality effects of the former disposal site. After more than 10 years of monitoring by the Port, most volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) were not detected in the groundwater. Although some metals were detected in groundwater at levels above (then current) water quality objectives, studies reported that the concentrations were typical of adjacent bayfront fill areas. Monitoring of near-shore surface water from San Francisco Bay indicated that the adjacent bay water did not contain TPH, VOCs, SVOCs, or metals at concentrations above water quality objectives. Based on this, the RWQCB issued Order No. 00-030 in 2000, rescinding Order No. 87-060.

AREAS ADJACENT TO 28-ACRE SITE

An area to the north of the 28-Acre Site (within the BAE Systems Ship Repair facility) includes petroleum products in the soil, referred to as non-aqueous phase liquid (NAPL).[47] This area is shown on Figure 4.P.1, p. 4.P.3, and the NAPL within this area occurs in discontinuous globules. These petroleum products are nonvolatile, insoluble, highly viscous, highly degraded, and essentially immobile; they do not pose a significant risk to human health or migration to San Francisco Bay.

Pier 70 Risk Management Plan

The Port has selected a remedial action approach for the *Pier 70 Preferred Master Plan* area, including the 28-Acre Site and the 20th/Illinois Parcel, that includes construction of a durable cover over the entire site that would prevent exposure to hazardous materials in the soil once the site is developed, and also the use of institutional controls to effectively manage site risks during construction and post-development maintenance activities that may breach the durable cover. The Pier 70 RMP, adopted in 2013, provides the framework for implementing the selected controls for managing residual constituents of concern in the soil, soil vapor, and groundwater.[48]

The Pier 70 RMP includes specific measures to be implemented during construction and maintenance activities, as well as post-development measures that must be implemented to minimize potential risks to the environment, current and future on-site employees, future

[47] Treadwell & Rollo, Pier 70 Risk Management Plan, p. 7.
[48] Treadwell & Rollo, Pier 70 Risk Management Plan.

residents, construction and maintenance workers, visitors, and the public. These measures in the Pier 70 RMP apply to the entire *Pier 70 Preferred Master Plan* area which includes the 28-Acre Site and the 20th/Illinois Parcel. The RWQCB is the lead agency overseeing implementation of the Pier 70 RMP and approved the RMP on January 24, 2014, after soliciting public review and comment.[49]

In accordance with the Pier 70 RMP, the RWQCB has developed Covenants and Environmental Restrictions that incorporate the requirements of the RMP and will be recorded in the deed of the property so all of the Pier 70 RMP requirements will run with the land and bind the Port and all future property owners to those requirements. This deed restriction is enforceable by the RWQCB. DPH is responsible for overseeing activities conducted in accordance with local regulations, including Articles 22A and 22B of the San Francisco Health Code, described below under "Local" in Regulatory Framework, pp. 4.P.47-4.P.48.

The site-specific risk management measures required by the Pier 70 RMP are summarized below and incorporate the risk management and soil management requirements of Article 22A of the San Francisco Health Code as well as the dust mitigation requirements of Article 22B of the San Francisco Health Code. However, DPH may require additional project-specific review and/or sampling as described below, as needed to fulfill the requirements of Article 22A.

NOTIFICATION REQUIREMENTS FOR GROUND-DISTURBING ACTIVITIES

The Pier 70 RMP specifies regulatory notification requirements for ground-disturbing activities within the *Pier 70 Preferred Master Plan* area that would disturb an area of 1,250 square feet or more of native soil, 50 cubic yards or more of native soil, 0.5 acre or more of soil, or 10,000 square feet or more of durable cover. The notification requirements are different for submittals that are compliant with the Pier 70 RMP and those that request a variance from the specific requirements of the RMP. For RMP-compliant submittals, the notification must include the following in accordance with Section 4.1.1 of the Pier 70 RMP, Notification for RMP Compliant Submittals:

- A description of current site conditions within the proposed limits of work.
- A description of the proposed ground-disturbing activity, together with appropriate exhibits to illustrate the location and/or issue that triggers the notification.
- Engineering design drawings stamped by a California-licensed professional that describe construction of the applicable components of the remedy, including installation of durable cover in accordance with the Pier 70 RMP and vapor monitoring system design plans for residential land use in areas where soil vapor or groundwater concentrations exceeded residential cleanup levels (see Figure 4.P.1, p. 4.P.3).

[49] San Francisco Bay Regional Water Quality Control Board, *Approval of July 25, 2013 Final Risk Management Plant, Pier 70 Master Plan Area, San Francisco, San Francisco County,* January 24, 2014.

- Completed project-specific plans including a Dust Control Plan, Stormwater Pollution Prevention Plan, Environmental Health and Safety Plan, Soil Import Plan, and Groundwater Management Plan as applicable to the project. The Pier 70 RMP includes specific criteria for each of these plans.
- A project schedule that tracks site activities and reinstallation of the durable cover following completion of the ground-disturbing activity.
- If the RWQCB has not provided comments within 45 days of the submittal, the project proponent (e.g., the project sponsors) may proceed with the ground-disturbing activity without a formal approval letter from the RWQCB. The RWQCB has the authority to stop work if they find that the notification package does not conform to the requirements of the Pier 70 RMP. This process does not replace or supersede the requirement for building or encroachment permits from the Port, but is in addition to the requirements of these permits.

If the project proponent is requesting a specific variance from the Pier 70 RMP, Section 4.1.2, Notification of RMP Variance Submittals, requires that they submit the following items in addition to those discussed above to demonstrate that human health and the environment are protected:

- A precise description of the request and reason for variance from the Pier 70 RMP.
- The analysis and reasoning of how the variance is protective of human health and environment, stamped by a California-licensed professional.

Variance requests must be submitted 60 days prior to performing the activity, and the project proponent is not allowed to proceed with the project until the RWQCB and Port have approved the variance.

Articles 22A and 22B Submittals. The project proponent must also notify DPH of any ground-disturbing activity of 50 cubic yards or more in accordance with Article 22A of the San Francisco Health Code and/or any activity affecting an area greater than 0.5 acre in accordance with Article 22B of the San Francisco Health Code as specified in Pier 70 RMP Section 4.2, Information Required for SFDPH Notification. In addition to the above requirements, the submittal must include a work plan stamped by a California-licensed professional that describes excavation activities (general limits and depth of excavation) and a proposed sampling plan to characterize soil within the excavation footprint. If additional sampling is not warranted, the project proponent may submit a site evaluation report, stamped by a California-licensed professional, instead of a work plan for additional sampling. Such a site evaluation report should describe the proposed excavation activities and provide an evaluation of the adequacy of existing data to characterize the potential risks related to the proposed activity. Both the work plan and site evaluation report are subject to DPH approval. Regardless of whether the project warrants submittal of a work plan or site evaluation report, a site history report is not required.

DEFINITION OF GROUND-DISTURBING ACTIVITIES

"Ground-disturbing activities" include, but are not limited to, (1) excavation of native soil; (2) grading or related construction of roads, utilities, facilities, structures, and appurtenances that disturbs native soil; (3) demolition or removal of "hardscape" (for example, concrete roadways, parking lots, foundations, asphalt, and sidewalks) that exposes native soil; (4) any activity that moves native soil to the surface from below the surface of the land; and (5) any activity that causes or facilitates the movement of known contaminated groundwater (RMP Section 4.0, Ground Disturbing Activity Notification and Reporting). Following completion of any ground-disturbing activities, all excavated soil must be handled in accordance with the soil management protocols and durable cover protocols specified in the Pier 70 RMP.

RISK MANAGEMENT MEASURES PRIOR TO DEVELOPMENT

The Pier 70 RMP (Section 5.0, Risk Management Measures Prior to Development) specifies access control measures, such as fencing and signage, to ensure that trespassers and visitors to the site are not exposed to unacceptable levels of chemicals in the soil. In addition, the RMP requires that the Port provides a fact sheet to all tenants, project proponents, and building owners/operators, informing them of the existing conditions, RMP requirements, and prohibited activities.

RISK MANAGEMENT MEASURES DURING CONSTRUCTION AND MAINTENANCE

Section 6.0 of the Pier 70 RMP specifies risk management measures that must be implemented during construction and maintenance to ensure that workers and the public are not exposed to unacceptable levels of hazardous materials in the soil and groundwater. These measures are discussed below.

Soil and Stormwater Management. During all construction, the Pier 70 RMP requires implementation of the following.

- A site-specific health and safety plan that addresses site health and safety requirements in accordance with applicable State and Federal health and safety standards, including protective elements such as use of personal protective clothing and equipment, air monitoring action levels, training and documentation protocols, and an emergency response plan (RMP Section 6.4, Environmental Health and Safety). If a ground-disturbing project triggers Article 22A of the San Francisco Health Code, the site safety plan must be certified and stamped by a Certified Industrial Hygienist and submitted to DPH for review and approval.
- Access controls that limit access only to authorized personnel in compliance with the site health and safety plan requirements (RMP Section 6.1, Access Controls during Construction).

- Soil management protocols that address on-site reuse of soil within the *Pier 70 Preferred Master Plan* area restrict the generation of visible dust emissions from excavation equipment and soil haul trucks, require wetting of unpaved roads to restrict generation of visible dust, and limit on-site truck speeds to prevent the generation of visible dust. These include:
    - Soil movement protocols that allow movement of soil within the boundaries of the *Pier 70 Preferred Master Plan* area and reuse of the soil with no further sampling, provided that reuse is conducted in accordance with the RMP and that no unknown or unexpected conditions are encountered (RMP Section 6.5.1, Movement of Soil). Soil that is excavated and moved must remain within the Pier 70 area and must be placed under durable cover. Alternately, soils may be disposed of off-site as provided in Section 6.8 of the RMP, Off-Site Soil Disposal.
    - Soil stockpile management protocols that require locating stockpiles in as close proximity to the work site as possible (RMP Section 6.5.2, Stockpile Management Protocols). The protocols must address stormwater runoff and dust generation.
    - A project-specific Soil Import Plan stamped by a California-licensed professional that requires sampling to demonstrate that imported soil quality meets the chemical criteria specified in the RMP (RMP Section 6.5.3, Soil Import Criteria, and Table 4 of the RMP which is provided in Appendix F, Hazards and Hazardous Materials).
- A dust control plan in accordance with Article 22B of the San Francisco Health Code, (RMP Section 6.6, Dust Control Plan). The dust control plan must incorporate existing State and local regulations applicable to maintenance, construction, and redevelopment activities, including Port Building Code Section 106A.3.2.3, San Francisco Health Code Article 22B, and the Asbestos Airborne Toxic Substances Control Measure (Asbestos ATCM) described under "State" in Regulatory Framework on pp. 4.P.45-4.P.46.
- A stormwater pollution prevention control plan prepared in accordance with the California State Water Resource Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities RMP Section 6.7, Construction Stormwater Management).
- Soil for off-site disposal must be analyzed for waste classification purposes then transported and disposed of in accordance with applicable laws for the disposal of hazardous and non-hazardous waste disposal (RMP Section 6.8, Off-site Soil Disposal).

If the durable cover, constructed in accordance with the post-development measures described below, is disturbed during construction or maintenance activities, the durable cover must be reestablished in accordance with the protocols of the Operations and Maintenance Plan, described below under "Annual Inspection and Reporting," pp. 4.P.25-4.P.26. Reestablishment of the cover must be documented in a completion report submitted and subject to approval by the Port and the RWQCB.

Temporary Dewatering. The Pier 70 RMP requires a project proponent to prepare a Groundwater Management Plan for the management of groundwater produced by temporary construction dewatering during construction (RMP Section 6.10.1, Temporary Dewatering Activities). Implementation of the Groundwater Management Plan provides for the safe handling of groundwater generated by dewatering and discharge of the groundwater in accordance with applicable regulations. The plan must assess the potential for groundwater dewatering to alter groundwater flow patterns. For projects in or around areas of known NAPL and DNAPL, the plan must include appropriate risk management measures as outlined in the Pier 70 RMP.

The Pier 70 RMP requires sampling of water removed during dewatering activities and profiling the water for disposal in accordance with applicable permits and regulations. If approved in advance by the Port and RWQCB, water may be reused for dust control purposes. Disposal options may include pre-treatment and discharge into the City's combined sanitary sewer system under a SFPUC batch wastewater discharge permit. A project proponent may also apply for an NPDES permit through the RWQCB for discharge to the Bay. The Port and the RWQCB are responsible for review and approval of the Groundwater Management Plan.

Unanticipated Conditions. A project proponent must also implement the RMP's protocol addressing unforeseen conditions such as unanticipated soil and/or groundwater contamination, unexpected subsurface structures, buried pipelines, USTs, and or other indications of contamination (RMP Section 6.9, Unanticipated Conditions Response Protocol). The protocol specifies that any USTs encountered must be closed in accordance with Article 21 of the San Francisco Health Code, described below under "Local" in Regulatory Framework on p. 4.P.21. In addition, the protocol requires a project proponent to stop work and consult a California-licensed professional in the event that unanticipated subsurface conditions are encountered. A project proponent is also required to notify the Port, RWQCB, and DPH within 5 days of discovering a non-emergency unanticipated subsurface condition.

Prevention of Conduits. The Pier 70 RMP requires that a project proponent avoid the installation of underground utilities in areas of known NAPL and DNAPL to the extent practicable (RMP Section 6.10.2, Conduits Prevention). If these areas cannot be avoided, a professional geologist or engineer must review existing data to determine where NAPL or DNAPL remains, and specify risk management measures to minimize the potential for the new utilities to become conduits for the spread of groundwater contamination, subject to approval by the RWQCB and/or DPH. Potential methods for control of groundwater include placing regularly spaced low-permeability materials within the backfill (e.g., concrete, a cement/bentonite mixture, or clayey materials) or installing barrier collars around the pipes. Potential methods for control of soil vapor include sealing the end of utility conduits with inert gas-impermeable material. The need for vapor controls is determined on a project-specific basis.

Prevention of Groundwater Intrusion. The Pier 70 RMP specifies that unpressurized pipelines constructed within zones of existing or newly identified groundwater contamination must be adequately sealed at pipe joints to prevent the intrusion of groundwater and constructed of materials that would not be degraded by the presence of chemicals in the groundwater (RMP Section 6.10.3, Groundwater Intrusion Prevention).

Groundwater Monitoring Wells. The Pier 70 RMP requires a project proponent to review available information prior to construction and identify any monitoring wells within the construction area (RMP Section 6.11, Groundwater Monitoring Wells). The wells must be appropriately abandoned prior to construction or protected during construction. If construction necessitates destruction of an existing well, the destruction must be conducted in accordance with California and DPH regulations, and must be approved by the RWQCB. The Port must also be notified of the destruction. Project proponents also may be required to reinstall any groundwater monitoring wells that are part of the ongoing groundwater monitoring network.

Shoreline Improvements. Under the Pier 70 RMP, shoreline construction is subject to existing regulatory and permitting requirements and should include the installation of a durable cover and/or shoreline revetment designed to prevent the migration of site soil (RMP Section 6.12, "Shoreline Improvements"). The Port and RWQCB must be contacted during the planning phase of any shoreline construction to obtain information concerning the nature of the sediments to be disturbed where known, requirements for work plans, and other specific requirements.

POST-DEVELOPMENT MEASURES

Durable Cover. The Pier 70 RMP requires placement of durable covers over any soil with chemicals at concentrations greater than cleanup levels for the planned land use (RMP Section 2.2.1, Description of Remedy). Durable covers will prevent human exposure to the soil and can include features such as new or existing buildings, new or existing roadways and sidewalks, new and existing hardscapes or paved parking areas, shoreline revetments, 6 inches of gravel overlying a demarcation layer, or landscaped areas covered with a minimum of 2 feet of clean imported soil. If a cover of clean soil is used, the clean soil layer must accommodate the depth of root-bearing zones and/or irrigation systems to ensure that general maintenance workers will not contact any of the native soil below the demarcation layer. The demarcation layer must provide a visual indicator that distinguishes the native soil beneath the demarcation layer from overlying clean soil. The demarcation layer is not intended to be impermeable to water. The Pier 70 RMP requires long-term maintenance and monitoring of the durable covers to ensure that they continue to function as designed. The Operation and Maintenance Plan provided in the Pier 70 RMP, discussed further below, provides the specific requirements for long-term maintenance and monitoring. If any maintenance or repair work disturbs durable cover, the integrity of the

previously existing durable cover must be re-established (RMP Section 7.2, Durable Cover Disturbance).

Additional Risk Evaluations and Vapor Intrusion Measures. As discussed above under "Groundwater Quality and Soil Vapor Quality," pp. 4.P.14-4.P.15, VOCs have been identified in the soil vapor and groundwater at concentrations greater than residential cleanup levels at locations within or adjacent to Parcels H1, E4, and B, as well as in the adjacent 20th Street Historic Core site. The Pier 70 RMP requires additional risk evaluation if these areas are to be used for residential purposes, potentially including additional soil vapor sampling to verify current conditions (RMP Section 2.2.1, Description of Remedy). Depending on the results of the risk evaluations, measures may be required to minimize or eliminate exposure to soil vapor that may migrate into new residential buildings without implementation of appropriate measures. Appropriate vapor intrusion measures may include, for example, design of an intrinsically safe building configuration; installation of a vapor barrier; and/or design and installation of a vapor monitoring system that is protective of the residential use. The project proponent may also demonstrate that vapor intrusion risks would be within acceptable levels (greater than 1×10^{-6} incremental cancer risk or a non-cancer hazard index greater than 1) under a project-specific development scenario.

Notification Requirement and Health and Safety. The Pier 70 RMP requires building or facility operators/owners and/or tenants to notify any future contractors of existing site conditions and hazards of exposure to native soil if routine maintenance that would impact durable cover is required (RMP Section 7.1, Notification and Reporting). Based on this information, contractors who perform any activity that will disturb native soil or impacted groundwater must develop a site health and safety plan to protect their workers during subject activities (RMP Section 7.3, Health and Safety).

COMPLETION REPORTS

Within 45 days of completing a ground-disturbing activity, a project proponent must submit a completion report to the Port, the RWQCB, and DPH (RMP Section 4.3, Completion Reports). The completion report must document the activity and, if necessary, any corrective actions implemented if the ground-disturbing activity encountered any unforeseen conditions. The completion report must include the following components, as appropriate.

- A description of activities performed;
- Boring logs/well completion diagrams;
- Laboratory analytical reports;
- Waste disposal manifests;

- As-built drawings of the components of the remedy, including the durable cover or other engineered control, stamped by a California-licensed professional;
- All permits and inspection reports of the installed remedy components, including the durable cover or other engineered control stating that it was properly installed and inspected by a California-licensed professional licensed in the technical area representative of the work;
- A long-term maintenance and monitoring plan for any permanent remedy components not covered by the Operation and Maintenance Plan for durable cover; and
- Other appropriate documentation or components as specified as a condition of undertaking the subject activity and/or required by the Port, RWQCB, and/or DPH.

The Port, DPH, and RWQCB must review all completion reports to confirm that the actions taken were consistent with the Pier 70 RMP procedures and protocols. The Port, DPH, and RWQCB are required to notify the project proponent of any discrepancies or deficiencies in the completion report within 45 days. Under the Pier 70 RMP, the project proponent(s), Port, DPH, and RWQCB must work collaboratively to resolve such issues. Upon concluding that the actions taken are consistent with the RMP, the RWQCB would issue an approval letter for the completion report.

OPERATION AND MAINTENANCE PLAN

The Operation and Maintenance Plan included as Appendix A of the Pier 70 RMP describes the long-term maintenance and monitoring requirements for the durable cover. This plan requires the Port or operators of facilities within the *Pier 70 Preferred Master Plan* area to retain a qualified professional to perform operations and maintenance activities, and specifies annual inspection requirements to observe for issues of concern, including any breach in the durable cover. The plan also specifies procedures for security when the cover is breached along with required maintenance and repair activities to maintain the durable cover. An emergency response plan is included that specifies procedures to be implemented in the event of an emergency (such as vandalism, fire, or flooding) that could affect the integrity of effectiveness of the durable cover.

ANNUAL INSPECTION AND REPORTING

The Pier 70 RMP requires annual inspections and production of an Annual Inspection Report (RMP Section 4.4, Annual Inspection and Reporting). For properties occupied by building/facility owners (e.g., development partners with tenants or other operators in new or renovated facilities) or operators (e.g., tenants in Port-owned facilities, Port in Port-operated facilities), the owners and operators are responsible for submitting the Annual Reporting and Operations and Maintenance Checklist to the Port by March 31 of the following year. The Port must conduct annual site inspections of the *Pier 70 Preferred Master Plan* area outside of those areas owned/operated by tenants or development partners, compile all owner/operator annual

checklists, and submit an Annual Inspection and Operations and Maintenance Checklist for the entire site to the RWQCB. The report prepared by the Port must include the results of the Port's annual inspection and self-certification of compliance with the Pier 70 RMP and deed restriction that has been recorded on the property.

Should the Port discover any actions or conditions inconsistent with the Pier 70 RMP at any time, including during the annual site inspection, the Port must prepare a written explanation indicating the specific deficiencies and what efforts or measures the Port has taken or will take to correct those actions. The Port must provide the written explanation to the RWQCB within 15 working days of discovery.

As the property owner, the Port is ultimately responsible for the annual inspection and reporting requirements, and incident reporting that is outside of the annual inspection process. The Port must work with the project proponents, building owner/operators, and/or regulatory agencies to correct any problem(s) discovered and cooperate with the agencies during the performance of their inspection and enforcement responsibilities.

PROHIBITED ACTIVITIES

The Pier 70 RMP prohibits using groundwater and prohibits growing vegetables, fruit, or any edible items for human consumption in native soil throughout the *Preferred Pier 70 Master Plan* area (see RMP Section 3.3, Prohibited Activities). Plants for human consumption may be grown in the *Pier 70 Preferred Master Plan* area only if they are planted in raised beds (above the approved durable cover) containing soil that was not obtained from the *Pier 70 Preferred Master Plan* area. Fruit trees (including nut-bearing trees) may be planted provided that they are grown in containers with a bottom that prevents the roots from penetrating the native soil. The Port, RWQCB, and DPH have the authority to perform inspections without prior notice to verify that no prohibited activities are being performed.

REGULATORY OVERSIGHT

The RWQCB is the lead agency providing oversight for implementation of the RMP and associated environmental investigations and remediation, but may delegate portions of the oversight to DPH. For implementation of Articles 22A and 22B of the San Francisco Health Code, DPH is the lead agency.

Pier 70 Article 22A Compliance

The project sponsors submitted a Site Evaluation Report and Subsurface Site Mitigation Plan for the 28-Acre Site and 20th/Illinois Parcel to DPH in August 2015.[50] This report fulfills the requirements of the soils analysis report and Site Mitigation Plan required by Article 22A of the San Francisco Health Code, Analyzing the Soils for Hazardous Waste (also referred to as the Maher Ordinance) for these areas. This report summarizes soil and groundwater quality at the 28-Acre Site and 20th/Illinois Parcel, and commits the project sponsors to implementing specific Pier 70 RMP requirements.

DPH conditionally approved the Site Evaluation Report and Site Mitigation Plan in November 2015.[51] The conditional approval requires the following additional information or documentation:

- Future documents will need to provide a narrative summary of analytical findings along with tables of the data and/or laboratory reports.
- A dust control addendum will need to be prepared to address new regulatory requirements and standards implemented since approval of the Pier 70 RMP in 2014. The conditional approval specifies additional measures that must be implemented to ensure that no visible dust crosses the property boundaries during construction.
- Soil stockpiles will need to be thoroughly wetted at the end of each day.
- The site mitigation plan will need to include measures to control dust from construction traffic.
- On-site signage must be in English, Spanish, and the predominant language of persons who use the area.
- The site safety plan will need to be submitted a minimum of 2 weeks prior to the start of work.
- A final report will need to be submitted at the completion of the project.

Deed Restriction

The Port recorded a deed restriction on the *Pier 70 Preferred Master Plan* area on August 11, 2016.[52] The deed restriction incorporates the information and requirements of the Pier 70 RMP

[50] Geosyntec Consultants, Site Evaluation Report and Subsurface Site Mitigation Plan, Article 22A Compliance Program, Pier 70 Waterfront Site, San Francisco, California (hereinafter referred to as "Site Evaluation Report and Site Mitigation Plan"), August 31, 2015.

[51] San Francisco Department of Public Health, Conditional Site Mitigation Plan Approval, Pier 70 Waterfront Site, Residential and Commercial Development; Open Space Land Use, Pier 60 – 28-Acre Site and 20th/Illinois Parcel, November 9, 2015.

[52] Covenant and Environmental Deed Restriction on Property, Property Consisting of Seawall Lot 349, Seawall Lot 345 (portion), Assessors Block 4110 (portion), and 20th Street (portion), generally bounded by Mariposa Street, Illinois Street, 22nd Street, and San Francisco Bay, San Francisco, California. August 11, 2016.

described above, and includes the following restrictions on uses within the *Preferred Master Plan* area:

- Native soil may not be used for growing produce for human consumption;
- Uses involving regular exposure to native soil are not permitted;
- Hospitals are prohibited; and
- No groundwater wells or groundwater uses are allowed for purposes other than construction dewatering.

The deed restriction is on file with the RWQCB and runs with the property. Accordingly, the requirements of the Pier 70 RMP apply to subsequent owners, tenants, and occupants of the property.

Hoedown Yard

PG&E has conducted several environmental investigations at the Hoedown Yard since 2006, including the analysis of numerous samples to assess soil and groundwater quality at the site. The screening-level human health risk evaluation conducted by PG&E in 2011 characterizes health risks associated with exposure to chemicals in the soil and groundwater based on the results of these investigations.[53] The human health risk evaluation addressed risks related to commercial and industrial land uses, but did not evaluate risks associated with potential future residential land uses because this land use was not anticipated when the risk evaluation was completed. The human health risk evaluation concluded that the vapor intrusion pathway does not present a potential health risk related to commercial or industrial use of the Hoedown Yard because VOCs were not consistently detected in the soil or groundwater and all detected concentrations were below their respective screening criteria, which are conservatively established and human health-based.

Soil Quality

Based on future use of the Hoedown Yard for commercial or industrial purposes, arsenic is the primary chemical of concern identified in the soil; it was identified at concentrations greater than the site-specific background level of 11.5 mg/kg in samples from the shallow fill materials within an approximately 140- by 140-foot area in the northwest corner of the property (see Figure 4.P.1, p. 4.P.3).[54] The maximum concentration was 530 mg/kg. Some soil samples from within this area also contained lead, TPH diesel, and TPH motor oil at concentrations exceeding the screening criteria for commercial land uses.

[53] AMEC, *Updated Human Screening-Level Health Risk Evaluation, Hoe Down Yard, 22nd Street and Illinois Street, San Francisco, California,* August 2011.
[54] AMEC, Hoe Down Yard Site Management Plan, pp. 4 and 5.

Several VOCs and SVOCs as well as other metals were identified in the soil samples, but none of the concentrations exceeded health-based screening levels. Pesticides, PCBs, and cyanide were not detected in any of the soil samples.

Seven soil samples were analyzed for naturally occurring asbestos which was detected in each sample analyzed at concentrations ranging from 0.50 percent to 6.30 percent, all of which exceed the screening level of 0.25 percent. On the basis of this, the human health risk evaluation recommended implementation of dust management practices during site remediation and construction to limit the potential resuspension of chrysotile asbestos associated with naturally occurring asbestos into the air. The human health risk evaluation also recommended evaluating the need for perimeter dust monitoring during these activities.

The human health risk evaluation concluded that, based on the presence of arsenic in the northwest portion of the Hoedown Yard, current and future industrial/commercial workers in this area as well as construction workers could be exposed to chemicals in the soil at concentrations that could pose a health risk.[55] In other areas of the Hoedown Yard, the human health risk evaluation concluded that none of the chemicals detected would pose a significant health risk to current or future workers.

Groundwater Quality

Groundwater beneath the Hoedown Yard is not considered a potential source of drinking water. Therefore, the human health risk evaluation compared groundwater concentrations to environmental screening levels for groundwater that is not a current or potential drinking water source. On the basis of three grab groundwater samples collected in 2006, the human health risk evaluation determined that the maximum detected concentration of TPH diesel and TPH motor oil (13,000 microgram per liter [µg/L] and 5,300 µg/L, respectively) exceeded the then-current environmental screening level of 2,500 µg/L for each compound. No other chemicals detected in the groundwater exceeded health-based screening levels. The human health risk evaluation did not recommend any long-term risk management measures to restrict exposure to chemicals in groundwater because there would be no contact with or use of groundwater when the site is developed. However, the human health risk evaluation concluded that any construction-related dewatering should be conducted in a way to preclude skin contact with the groundwater by the construction workers.

Site Management Requirements

PG&E prepared an SMP in 2012 specifying procedures for protection of human health and the environment during routine site maintenance/construction activities where workers could be

[55] AMEC, Hoe Down Yard Updated Screening Level Health Risk Evaluation, p. 11.

exposed to environmentally impacted soil and groundwater, referred to as the Hoedown Yard SMP.[56] The RWQCB concluded in December 2012 that with implementation of the requirements of the Hoedown Yard SMP, no further action is required related to the investigation or remediation of the Hoedown Yard under the current industrial land use.[57] However, the Hoedown Yard SMP considers potential exposure under PG&E's current and future use of the site for industrial purposes, but does not consider future residential uses of the property. The SMP must be modified if there is a change in property use, if there is a change in understanding of environmental conditions at the site, if there are planned intrusive activities that are not addressed in the SMP, or if new legal or regulatory requirements are implemented.

NOTIFICATION REQUIREMENTS

Consistent with existing law and local ordinances, the Hoedown Yard SMP requires the following notification requirements for activities that will disturb soil or groundwater (see SMP Section 4.2, Notifications):

- Notification of DPH of work disturbing 50 cubic yards or more of soil in accordance with the Article 22A of the San Francisco Health Code;
- Notification of DPH of work that could generate dust in accordance with the Article 22B of the San Francisco Health Code;
- Notification of the Bay Area Air Quality Management District (BAAQMD) of work that would disturb 1.0 or more acres of soil containing naturally occurring asbestos in accordance with Title 17 of the California Code of Regulations, Section 93105; and
- Notification of the RWQCB of work requiring water management activities (such as excavation dewatering or storm water management).

HEALTH AND SAFETY DURING CONSTRUCTION AND MAINTENANCE

The Hoedown Yard SMP requires implementation of a health and safety plan for the protection of construction workers and maintenance workers who could come into contact with the soil or groundwater (SMP Section 5.0, Guidelines for Health and Safety During Construction/Maintenance Activities). The plan must include measures consistent with Cal-OSHA regulations and specify personal protective equipment to be used, decontamination procedures, spill response procedures, and emergency contact information, as detailed in the SMP. Other measures to prevent public exposure to hazardous materials during construction and ensure appropriate management of soil and groundwater encountered during construction are described below.

[56] AMEC, Hoe Down Yard Site Management Plan. 2014-001272ENV.
[57] San Francisco Bay Regional Water Quality Control Board, No Further Action Status, Hoe Down Yard Area, Potrero Power Plant, City and County of San Francisco, December 6, 2012.

DUST MANAGEMENT MEASURES

The Hoedown Yard SMP requires implementation of dust control and dust monitoring measures, described below, to minimize the potential for exposure to arsenic, TPH, and naturally occurring asbestos in the soil during construction and maintenance activities.

Dust Control. The following dust control measures are required to minimize potential exposure to residual chemicals and naturally occurring asbestos in dust generated during construction or maintenance activities (SMP Section 6.1, Dust Management Measures):

- Stabilizing unpaved areas subject to vehicle traffic by adequate wetting, treatment with a chemical dust suppressant, or by covering with material that contains less than 0.25 percent asbestos to prevent visible emissions from crossing the property line.
- Restricting vehicle and equipment speeds to no more than 10 miles per hour to prevent vehicles from generating visible dust which crosses the property line.
- Applying sufficient water prior to any ground disturbance to prevent visible dust from crossing the property line.
- Stabilizing stockpiles of soil and disturbed areas not subject to vehicular traffic by keeping them adequately wetted, treated with a chemical dust suppressant, or covered by a tarp or material that contains less than 0.25 percent asbestos when material is not being added to or removed from the pile.
- Washing down equipment or using one of the following track-out prevention measures before the equipment is moved from the property onto a paved public road:
    - a gravel pad designed using good engineering practices to clean the tires of exiting vehicles;
    - a tire shaker;
    - a wheel-wash system;
    - pavement extending for not less than 50 consecutive feet into the site from the intersection with the paved public road; or
    - any other measure as effective as the measures listed above.
- Preventing track-out from any construction project that is visible on any paved roadway open to the public. Visible track-out on a paved or public road must be cleaned within 24 hours using wet sweeping or a high-efficiency particulate air (HEPA) filter-equipped vacuum device.
- Ensuring that equipment and operations do not cause the emission of any visible dust that crosses the property line.
- Conducting any load-out of soil or debris from the site such that no spillage can occur from holes or other openings in cargo compartments.

The Hoedown Yard SMP also specifies the following procedures that may be used to control emission of dust from disturbed surfaces after completion of intrusive site activities:

- Establishing a vegetative cover;
- Placing at least 3 inches of non-asbestos-containing material;
- Paving; or
- Any other measures deemed sufficient to prevent wind speeds of 10 miles per hour or greater from causing visible dust emissions.

The Hoedown Yard SMP also specifies that activities that disturb soil containing greater than 0.25 percent naturally occurring asbestos must comply with the Asbestos ATCM. In general, work disturbing less than 1.0 acre of soil requires specific work practices. If the work would disturb greater than 1.0 acre of land, preparation of an Asbestos Dust Mitigation Plan for review and approval by the BAAQMD would be required prior to starting work. (See additional discussion of the Asbestos ATCM under "State" in Regulatory Framework, pp. 4.P.45-4.P.46.)

Dust Monitoring. The Hoedown Yard SMP specifies requirements for monitoring worker exposure to naturally occurring asbestos and other constituents during construction activities (SMP Section 6.2, Dust Monitoring). The exposure monitoring requirements are specified in California's Construction Safety Orders contained in Title 8 of the California Code of Regulations, Subchapter 4, Article 4, Section 1529. The purpose of the requirements is to evaluate the potential for specific site activities (e.g., grading or trenching) to result in worker exposures to naturally occurring asbestos and other constituents. The dust monitoring would be used to evaluate the effectiveness of dust control measures and to determine the need for additional dust control measures to reduce airborne levels of asbestos and other constituents.

SOIL AND WATER MANAGEMENT MEASURES

The Hoedown Yard SMP specifies soil-handling procedures to prevent unacceptable worker exposure to hazardous materials during construction or maintenance activities.

Stockpile Management. In addition to the dust control measures already specified, the Hoedown Yard SMP requires that stockpiles are protected from the adverse effects of rainfall and winds (SMP Section 7.1.2, Soil Stockpiling). Accordingly, the SMP requires that stockpiles are watered and securely covered with a tarp to prevent wind erosion and dust generation. The stockpiles must be separated from public areas by a fence and be located in an area with no direct connection to the storm drain system or Bay shore.

On-Site Reuse of Soil. The Hoedown Yard SMP emphasizes that to the extent possible, soil excavated during construction or maintenance activities should be reused onsite rather than disposed of offsite (SMP Section 7.1.3, On-Site Reuse of Soil). To accomplish this, the

Hoedown Yard SMP specifies that excavated soil must be temporarily stockpiled and evaluated for potential re-use. This evaluation may include additional sampling to evaluate the concentration of asbestos and metals in the soil, which would be determined by the engineer or consultant conducting the work or PG&E's Environmental Field Specialist. Soil exhibiting physical evidence of environmental impacts such as staining or odors must be stockpiled separately for characterization and off-site disposal. The SMP specifies that soil generated from within the area of arsenic impacts may not be re-used for any purposes within the Hoedown Yard.

Off-Site Disposal of Soil. Soil designated for off-site disposal must be sampled and characterized for waste disposal purposes. Soil characterized as a Federal or State hazardous waste must be disposed of at a licensed hazardous waste facility. The Hoedown Yard SMP specifies that in accordance with applicable law, soil containing greater than 1 percent asbestos must be disposed of at a facility licensed to accept friable (easily crumbled) asbestos-containing material. However, the soil would not be classified as a hazardous waste on the basis of asbestos concentrations (SMP Sections 7.1.4, Off-Site Soil Disposal, and 7.1.1, Soil Handling).

Excavation Dewatering. Based on the presence of TPH diesel and TPH motor oil in the groundwater, the Hoedown Yard SMP specifies measures to be implemented to protect workers from contact with groundwater during excavation dewatering, including containerization and appropriate disposal of groundwater (SMP Section 7.1.5, Excavation Dewatering). The SMP requires testing to establish water quality and compliance with the discharge limitations applicable to discharges to the City's combined sewer system, the stormwater system, or an appropriately permitted off-site facility.

Stormwater Management. Contractors must prepare a Stormwater Pollution Prevention Control Plan in accordance with the SWRCB NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (SMP Section 7.1.6, Stormwater Management), including implementation of best management practices (BMPs) specified in the required Stormwater Pollution Prevention Plan to minimize the sediment load in stormwater runoff and prevent a release of hazardous materials to stormwater.

Site Access and Security. Access to areas where soil will be disturbed must be controlled with caution tape, cones, fencing, steel plates, or other measures that clearly designate the active work area and prevent access by the public (SMP Section 7.17, Site Access and Security). Stockpiles of excavated soil shall be secured by temporary fences or other means to prevent unauthorized access.

The Hoedown Yard is bounded by secure perimeter fencing preventing unauthorized access. Contractors should not damage perimeter fencing. Site perimeter security fencing should not be altered or removed without the approval of PG&E. Should removal or modification of perimeter

fencing be necessary to facilitate construction, a temporary security fencing plan and fencing replacement plan must be developed and approved by the owner and/or PG&E's Environmental Field Specialist. The plan must include details for replacement of perimeter fencing and must conform to local building codes.

Unanticipated Subsurface Conditions. The Hoedown Yard SMP acknowledges that previously unidentified subsurface features could be present at the site including slabs and piping associated with the former aboveground storage tanks, USTs, and concrete vaults (SMP Section 7.2, Unanticipated Subsurface Conditions). Previously unidentified contamination also may be present. If unanticipated conditions are identified, the SMP requires notification of PG&E's Environmental Field Specialist to make the appropriate regulatory notifications. If significant odors are identified, the SMP requires that work is immediately stopped and that the work area is covered.

RESPONSIBILITIES AND MODIFICATIONS TO HOEDOWN YARD SITE MITIGATION PLAN

PG&E is responsible for overseeing implementation of the Hoedown Yard SMP and PG&E workers and/or contractor(s) are responsible for adhering to the SMP, as discussed in Section 8.1, Responsibilities, of the SMP.

Deed Restriction

PG&E recorded a deed restriction on the Hoedown Yard on October 17, 2012.[58] The deed restriction incorporates the information and requirements of the Hoedown Yard SMP described above, and restricts future property uses to industrial/commercial. Residences, hospitals, health care facilities, schools, day care centers, senior centers, or agricultural uses are specifically prohibited under the existing conditions. In addition, the RWQCB must be notified of any construction or maintenance activities that would disturb 50 cubic yards or more of soil. The deed restriction is on file with the RWQCB and runs with the property. Accordingly the requirements of the SMP apply to subsequent owners of the property. However, new owners may apply to the RWQCB for a written variance from the provisions of the deed restriction. The deed restriction requires a revised risk assessment and potentially site remediation if the Hoedown Yard would be used for residential purposes.

Offshore Sediments

Investigations by PG&E have detected elevated PAH concentrations in the sediments offshore of the Potrero Power Plant and 28-Acre Site in an area referred to as the Offshore Sediment Area

[58] Covenant and Environmental Deed Restriction on Property, Potrero Hoe Down Yard, 1201 Illinois Street, San Francisco, California. APN 4110-008A, & Michigan Street (portion). October 17, 2012.

shown on Figure 4.P.1, p. 4.P.3. The PAHs are likely the result of the historical manufactured gas plant, power plant, and other industrial operations at the Potrero Power Plant; the investigation and remediation of the sediments is the responsibility of PG&E. Based on PG&E's investigations, the Offshore Sediment Area is divided into two zones requiring remediation:

- The Nearshore Zone which extends approximately 50 to 75 feet from the shoreline and includes areas within the former slipways at the 28-Acre Site. The sediments in this zone contain construction debris, remnants of wooden and concrete pilings, and similar debris associated with former industrial operations. This zone exhibits the highest PAH concentrations found in surface sediments within the Offshore Sediment Area.
- The Transition Zone which extends another approximately 100 to 150 feet bayward from the Nearshore Zone. The sediments in this zone contain PAHs at concentrations that are much lower than in the Nearshore Zone, but greater than the Central San Francisco Bay ambient sediment concentrations.

For remedial planning purposes, the Offshore Sediment Area is divided into three segments. Segment 1 and the northern portion of Segment 2 are adjacent to the 28-Acre Site, as shown on Figure 4.P.1, p. 4.P.3; the southern portion of Segment 2 and Segment 3 are adjacent to the Potrero Power Plant and only a portion of Segment 3 is included on the figure. The preferred remedial alternative for the offshore sediments includes dredging up to several feet of sediment from all three segments of the Nearshore Zone to remove those sediments with the highest concentration of PAHs and placement of a cap over the entire Nearshore Zone. In Segment 1, adjacent to the 28-Acre Site, the approach also includes using Enhanced Monitored Natural Recovery to enhance the natural recovery of contaminated sediments by accelerating natural sedimentation rates and encouraging the recolonization of benthic organisms that live in the sediments. Additional remediation is planned in the Transition Zone, 100 to 150 feet offshore.

The RWQCB approved this remedial approach on December 11, 2015, and PG&E is currently preparing a remedial action plan for implementation of the selected remedy.[59] The draft remedial action plan was expected to be submitted to the RWQCB by mid-2016, but had not yet been submitted as of November 2016.

RECENT CHEMICAL USES

The Phase I ESA completed for the 28-Acre Site notes chemical usage by several Port tenants in 2011, including the following.[60]

- In 2011, Auto Return collected oily absorbents from leaking automobiles and stored them in drums for off-site disposal. This facility also used propane stored in small

[59] San Francisco Bay Regional Water Quality Control Board, Approval of October 9, 2015, Draft Feasibility Study Report, Offshore Sediment Area, Protrero Power Plant, City and County of San Francisco. December 11, 2015.
[60] Geosyntec Consultants, Pier 70 Phase I ESA, pp. 34 and 35.

aboveground tanks to fuel forklifts. Subsequent to preparation of the Phase I ESA, Auto Return has moved from the project site.

- SOMArts used small quantities of paints and cleaners that were stored in a flammable storage cabinet and workshop container.
- Sims Metals included a hazardous materials and waste trailer on the north side of its facility. The trailer was covered, had a locking mechanism, and contained waste oil collected from scrapped vehicles, batteries, and other universal waste removed from scrapped appliances (e.g., mercury switches, light ballasts). Subsequent to preparation of the Phase I ESA, Sims Metals has moved from the project site.

The Phase I ESA also noted a small container crusted with a thick brown substance located to the east of a parked bus, adjacent to the eastern boundary of the 28-Acre Site, in the central lot leased by Affordable Self Storage. The container was sitting on gravel and was in good condition. In the courtyard area (located in the northwest corner of the 28-Acre Site, immediately south of the 20th Street Historic Core), there was a pile of wood beams resembling railroad ties that had a couple of small containers sitting on the ties. There were also small containers in the hazardous waste storage area to the west of Building 14 (within the 20th Street Historic Core adjacent to the eastern boundary of the 20th/Illinois Parcel). No spills or obvious signs of mismanagement of any of these materials were noted.

No USTs or aboveground storage tanks are in use at the 28-Acre Site.[61] The Phase I ESA did note two small, old aboveground tanks that were not in use. One was located on the storage racks in front of Building 116 and one was located adjacent to the northwest side of Building 66. The tanks were small and appeared empty. There were no signs of leaks from these tanks. In addition, former process tanks were noted in the courtyard area adjacent to the 28-Acre Site (within the 20th/Illinois Parcel), but these tanks were not in use.

Based on the environmental database review completed for the Phase I ESA, the City and several tenants manifest hazardous waste for off-site disposal.[62] This indicates that hazardous wastes have been generated on site, but does not indicate that a release has occurred.

PCB-CONTAINING ELECTRICAL TRANSFORMERS

Electrical transformers are in use in several locations of the 28-Acre Site and historically may have been used or stored in other locations. Known electrical transformers include:

- Former Building 3, which has been demolished, included transformers.[63] Currently, a parking lot is in the location of this former building;

[61] Geosyntec Consultants, Pier 70 Phase I ESA, p. 36.
[62] Geosyntec Consultants, Pier 70 Phase I ESA, pp. 49 to 53.
[63] Geosyntec Consultants, Pier 70 Phase I ESA, Table 1, p. 18 of 23.

- A utility room in Building 12 included a PCB-containing transformer in 2011;[64]
- Building 19, which historically has been used as a garage, was previously used for storage of PCB-containing transformers;[65] and
- Building 21 houses transformers currently used a part of the electrical substation in the building. Based on their age, some of the transformers may include PCB-containing oils.

The Phase I ESA for the project site reports that, based on information available in the California Department of Toxics Substances Control (DTSC) on-line Envirostor Database, the following cleanup activities have been conducted at or near Building 21, referred to as Operational Area 1 in the following text, and Building 12, referred to as Operational Area 2:[66]

> "In 1981, IT Corporation conducted a cleanup of polychlorinated biphenyls (PCBs) at the Site as a result of an EPA inspection after a fire occurred in the area between Pier 7 and 8 in November, 1980. Old leaking transformers containing PCBs were removed from operational areas 1 and 2, and the fire damaged area. Walls, floors, and asphalt driveways were sampled with wipes. PCB (Aroclor 1260) results before cleanup ranged from 17 to 5,888 microgram per wipe (ug/wipe) in Operational Area 1, from 3 to 229 ug/wipe in Operational Area 2, and from less than 1 microgram per wipe area (ug/wipe area) to 49,200 ug/wipe area in the fire damaged area. Samples taken from the floor area (asphalt floor) ranged from non-detect to 62 parts per million (ppm). Aroclor 1260 was not detected in samples of mud, water or mussels in the area where the fire occurred (adjacent to the east of the Site). After decontamination, confirmation samples were taken in operational area 1 and 2. Samples collected in operational area 1 ranged from 4 to 80 ug/wipe, and from less than 1 ug/wipe to 32 ug/wipe for operational area 2. The fire damaged area results ranged from non-detect to 82 ug/wipe. The asphalt confirmation samples were all within residential cleanup levels. The cleanup level for Aroclor 1260 was 220 ug/wipe area for residential and 1,000 ug/wipe area for industrial."

HAZARDOUS BUILDING MATERIALS

Building 21 was constructed in approximately 1900. The remaining existing structures at the project site, including Buildings 2, 11, 12, 15, 16, 19, 25, 32, 66, and 117, were constructed between 1937 and 1945. Based on their age, hazardous building materials may have been used in their construction. These potential hazardous building materials include asbestos-containing

[64] Geosyntec Consultants, Pier 70 Phase I ESA, Table 1, p. 14 of 23.
[65] Geosyntec Consultants, Pier 70 Phase I ESA, Table 1, p. 10 of 23.
[66] Geosyntec Consultants, Pier 70 Phase I ESA, p. 48.

materials;[67] electrical equipment such as transformers and fluorescent light ballasts that contain PCBs[68] or bis (2 ethylhexyl) phthalate (DEHP);[69] fluorescent lights containing mercury;[70] and lead-based paints.[71]

Surveys have been conducted to assess the presence of asbestos-containing materials in three of the site buildings:

- A 1998 survey of the Building 2 roofing materials identified asbestos-containing materials in the tar and gravel composite roofing as well as in the roof sealants and/or felts used on the flashings of the parapets and where vents penetrated the roof.[72] The transite vent pipes were also constructed of asbestos-containing materials. The asbestos content of these materials ranged from 5 to 30 percent. Also in 1998, a survey identified chrysotile asbestos in boiler insulation at 15 percent, and amosite asbestos at 40 percent.[73] A building survey conducted in 2008 identified fiberboard ceiling materials as potential

[67] Because of its physical properties, asbestos was commonly used until the 1970s as a component of numerous building materials, including use in insulation materials, shingles and siding, roofing felt, floor tiles, the mastic used to affix floor tiles to the floor, and acoustical ceiling material. Asbestos was also used in pipe gaskets, valve packing, and automotive brakes and clutches. Today, asbestos continues to be used in roofing mastic. Asbestos is a known carcinogen and may present a public health hazard if it is present and exposed in the friable (easily crumbled) form. Long-term, chronic inhalation of asbestos can cause lung diseases such as asbestosis, mesothelioma, and lung cancer.

[68] PCBs are mixtures of synthetic organic chemicals with physical properties ranging from oily liquids to waxy solids. PCBs are a known human carcinogen; they are highly toxic substances that remain persistent in the environment, accumulate in biological systems, interfere with the reproductive system, and act as immuno-suppressants.

[69] Between 1979 and the early 1990s, DEHP was used in place of PCB as a dielectric fluid in some fluorescent light ballasts and other electrical equipment. DEHP is classified as a probable human carcinogen by the U.S. Department of Health and Human Services and as a hazardous substance by the U.S. EPA.

[70] Spent fluorescent lamps and tubes commonly contain mercury vapors and are considered a hazardous waste in California (California Code of Regulations [CCR], Title 22, Section 66261.50).

[71] Lead-based paint is paint that contains lead, a heavy metal historically added to paint as pigment and to speed drying, increase durability, retain a fresh appearance, and resist moisture (which causes corrosion); 17 CCR Section 35033 defines lead-based paint as paint that contains 1.0 milligram of lead per square centimeter of paint, or 5,000 mg/kg of lead. Because of its toxicity, paint containing more than 0.6 percent lead was banned for residential use in 1978 by the U.S. Consumer Product Safety Commission, but continues to be used in some industrial applications. Lead is toxic to humans, particularly young children, and can cause a range of human health effects depending on the level of exposure. When adhered to the surface of a material, lead-based paint poses little health risk. Where the paint is delaminated or chipping, it can cause a potential threat to the health of young children or other building occupants who may ingest the paint. Lead dust also presents public health risks during the demolition of structures that contain lead-based paint, particularly when metal coated with paint containing lead is torch cut. Similarly, the lead concentrations of coatings applied to many types of ceramic tiles as glaze may result in exposure to workers when dust is generated by breaking the tiles. Lead-based paint that has separated from a structure and dust generated from breaking ceramic tiles may also contaminate nearby soil.

[72] IHI Environmental, Pier 70 Warehouse #2 Roof Asbestos Material Sampling, July 29, 1998, pp. 2 and 3.

[73] Ecology and Environment, *Phase I Environmental Site Assessment for Maritime Use Area of Pier 70.* March 12, 2001, pp. 4-4 through 4-19.

asbestos-containing materials.[74] Beige paint in the building was classified as lead-based paint because it contained 12 percent lead. Other paint samples contained 2.4 to 4.1 percent lead.

- A survey of Building 11 in 2005 found asbestos in the gray roof caulk, ceiling mastic, transite wall and ceiling boards, and pipe insulation at concentrations ranging from 2 to 25 percent.[75] The survey also stated that the following building materials are assumed to contain asbestos: building paper, roofing materials, floor tile, gaskets, ceiling tape, and a metal-asbestos flue. The 2005 survey noted lead-based paint throughout much of the building.[76]
- A limited inspection to assess the asbestos content of the glazier's putty used on the windows of Building 12 found that asbestos was not detected in any of the 12 samples analyzed in 2014.[77] A building survey conducted in 2008 identified fiberboard wainscoting that could contain asbestos.[78]
- A 2008 inspection identified asbestos-containing materials in the root tar and felt as well as debris on the roof of Building 21.[79] The concentrations ranged from 3 to 40 percent. With lead concentrations of 120,000 mg/kg and 6,300 mg/kg, the off-white paint on the interior panels and on the steel I-Beam is considered lead-based paint. Gray paint on the interior panels contained lead at 2,300 mg/kg. In 1981, old leaking transformers were removed from Building 21.

In addition, the Phase I ESA notes that PCB-containing ballasts and mercury switches and thermostats were present in most buildings when investigated.[80]

Prior to 1912, isolated steam-powered plants generated electricity for all machinery at certain off-site portions of Pier 70 including the boiler shop (Building 14), machine shop (Building 113), and foundry, as well as for the steam compressors used for air tools.[81] Based on their age, the pipes associated with these utilities are likely to include transite materials.

REGULATORY FRAMEWORK

Hazardous materials and hazardous wastes are subject to extensive Federal, State, and local regulations, with the major objective of protecting public health and the environment. In general, these regulations define hazardous materials; establish reporting requirements; set guidelines for

[74] Carey & Co. and OLMM, Inc., *Historic Buildings Condition and Assessment*, May 2008, p. 6.
[75] Port of San Francisco, Notice To Employees, Owners, Lessees, Sublessees, Agents, and Contractors. Asbestos in Buildings. For: SWL 3491/Noonan Building. For Period Through: April 2012, pp. 3 and 4.
[76] SCA Environmental, Inc. *2008 Report Summaries, Pier 70 Buildings, San Francisco, CA*, May 29, 2008, Appendix A, p. 3.
[77] VBA, Inc., *Hazardous Materials Inspection Report, Pier 70, Building 12, San Francisco, CA*, May 22, 2014.
[78] Carey & Co. and OLMM, Inc., *Historic Buildings Condition and Assessment*, May 2008, p. 35.
[79] SCA Environmental, Inc., *2008 Report Summaries, Pier 70 Buildings, San Francisco, CA*, May 29, 2008, Appendix A, p. 4.
[80] Geosyntec Consultants, Pier 70 Phase I ESA, p. 28.
[81] Geosyntec Consultants, Pier 70 Phase I ESA, p. 14.

handling, storage, transport, remediation, and disposal of hazardous wastes; and require health and safety provisions for workers and the public. The major Federal, State, and regional agencies enforcing these regulations include the U.S. Environmental Protection Agency (EPA), OSHA, and the U.S. Department of Transportation (DOT) at the Federal level; the DTSC, SWRCB, and RWQCB at the State level; and the BAAQMD at the regional level. Various agencies and departments of the City and County of San Francisco implement and enforce these requirements as well as specific requirements of the City and County of San Francisco, as discussed below.

FEDERAL

State and local agencies often have either parallel or more stringent rules than Federal agencies. In most cases, to the extent that State law is more stringent than Federal law, it prevails over Federal law and enforcement of these laws is typically the responsibility of the State, or of a local agency to which enforcement powers are delegated.

PCB Regulations

Under the Toxic Substance Control Act, the EPA began to impose bans on PCB manufacturing and sales and on most PCB uses in 1978; however, some electrical transformers still in use today use oils that contain PCBs. Title 40 of the Code of Federal Regulations, Section 761.60, allows disposal of transformers that contain greater than 50 parts per million PCB at a chemical waste landfill, if they have been drained of free liquids. If the PCB concentration is greater than 500 parts per million, the transformer must also be cleaned once it is drained. If the PCB concentration of the liquid is 500 parts per million or more, the liquid must be incinerated or destroyed using an EPA-approved alternative method. If the PCB concentration is between 50 and 499 parts per million, the liquid may be disposed of at a chemical waste landfill provided that the waste is not ignitable and is stabilized to a non-flowing consistency; these liquids may also be disposed of in an EPA-approved high-efficiency boiler or incinerated. Under Federal regulations, any transformer containing less than 50 parts per million PCBs in its dielectric fluid is considered a non-PCB transformer and its disposal is not regulated by Part 761, though the transformer must be disposed of responsibly.

Title 40 of the Code of Federal Regulations, Section 761.61, governs the management of PCB waste generated as the result of PCB spills and associated cleanup activities (e.g., contaminated environmental media, rags, debris). The EPA provides guidance for compliance with these regulations in their publication "Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act."[82] In accordance with these regulations, the surfaces of a building would be considered a PCB remediation waste if they have been contaminated by a

[82] U.S. EPA, Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act, November 2005.

spill of PCB liquids. Common building surfaces such as floors, walls, and ceilings made of concrete, brick, wood, plaster, or plasterboard are considered porous surfaces under these regulations. In high-occupancy areas, such as those included in the Proposed Project, porous surfaces must be cleaned to a PCB level of 1 part per million or less. Any wastes produced as part of the cleanup must be disposed of in accordance with the requirements of Section 761.61.

STATE

Hazardous Waste Classification Criteria

In accordance with Title 22 of the California Code of Regulations, Section 66261.20, et seq., excavated soil would be classified as a hazardous waste for off-site disposal purposes if it exhibits the characteristics of ignitability, corrosivity, reactivity, or toxicity. A waste is considered toxic in accordance with Title 22 of the California Code of Regulations, Division 4.5, Article 3 Section 66261.24, if it contains certain substances at concentrations that meet any of the following thresholds:

- Total concentrations of certain substances at concentrations greater than the State TTLC;
- Soluble concentrations greater than the State STLC;
- Soluble concentrations of certain substances greater than Federal toxicity regulatory levels using a test method called the Toxicity Characteristic Leaching Procedure (TCLP); or
- Specified carcinogenic substances at a single or combined concentration of 0.001 percent or more.

Under Section 66261.24, a waste would be considered hazardous under State and Federal regulations if the soluble concentration exceeds the TCLP level as determined by the TCLP method. Because the TCLP involves a 20-to-1 dilution of the sample, the total concentration of a substance in the soil would need to exceed 20 times the regulatory level for the soluble concentration to exceed the regulatory level in the extract. A waste would also be considered hazardous under State regulations if the soluble concentration of a substance exceeds the STLC determined by a waste extraction test, which involves a 10-to-1 dilution of the sample. Because of this, the total concentration of a substance would need to exceed 10 times the STLC for the soluble concentration to possibly exceed the STLC in the extract. A waste also may be classified as toxic if testing indicates toxicity greater than specified criteria.

Asbestos-Containing Materials

Asbestos wastes transported off-site are considered a hazardous waste in accordance with Title 22 of the California Code of Regulations, Division 4.5, Article 3 Section 66261.24, if the asbestos is friable and the asbestos content is 1 percent or greater.

Lead-Based Paint

Demolition debris that is painted with lead-based paint that is intact may or may not be considered hazardous waste. In order for the entire item to be hazardous, the lead concentration in the paint and the painted item (i.e., door, beam, etc.) must exceed a TTLC of 1,000 mg/kg of lead, STLC of 5 mg/L, or TCLP of 5 mg/L in accordance with Title 22 of the California Code of Regulations, Division 4.5, Article 3 Section 66261.24. In most cases, the lead concentration from the intact paint alone would not exceed hazardous lead levels for both the item and the intact paint; therefore, most materials with intact lead-based paint can be disposed of through normal practices at a regularly licensed waste facility. If the paint has been separated from the building material (e.g., chemically or physically removed), then the paint waste should be evaluated independently from the building material to determine if it is hazardous and to identify the proper management practice.

Polychlorinated Biphenyls

In California, PCB wastes are regulated as hazardous waste under Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Section 66261.24, if the PCB concentration exceeds TTLC of 50 mg/kg or the soluble concentration exceeds the STLC of 5 mg/L.

Asbestos Abatement in Buildings

Section 19827.5 of the California Health and Safety Code requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable Federal regulations regarding hazardous air pollutants, including asbestos. The BAAQMD is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and implements the California regulatory requirements through Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). Pursuant to California law, the Port will not issue a permit for demolition or renovation of a building until the applicant has complied with the following notice and abatement requirements.

In accordance with Regulation 11, Rule 2, the BAAQMD must be notified 10 days in advance of proposed demolition or abatement work that would involve removal of asbestos-containing materials. Notification includes the following:

- The names, addresses, and telephone numbers of both the owner(s) of the structure and the operator of the demolition or renovation;
- A description of the structure to be renovated, including location, size, number of floors, age of the oldest portion, and the present and prior use;
- The approximate amount of friable asbestos that would be removed;

- The name, address, and telephone number of the person who completed the asbestos survey, including the State Occupational Safety and Health Administration (CalOSHA) certification number;
- The procedures used, including the laboratory method, to locate asbestos-containing materials;
- The scheduled starting and completion dates of demolition or renovation;
- A description of the planned demolition or renovation and the methods to be used;
- A description of work practices and engineering control to be used, including emission control procedures for asbestos removal and waste handling;
- The name, address, and location of the waste disposal site to be used;
- Certification that at least one trained person will supervise the asbestos removal described in the plan;
- Procedures to be followed in the event that unexpected friable asbestos is encountered; and
- The name, address, and telephone number of the waste transporter.

Rule 11, Regulation 2 requires a survey of any building planned for demolition to identify asbestos-containing materials that may be present. If asbestos-containing materials are identified, they must be removed prior to demolition or alteration activities. During renovation, regulated asbestos-containing materials also must be removed prior to any operations that would cover the asbestos materials, making them inaccessible. During removal activities, the contractor must implement controls to ensure that there are no visible asbestos emissions to the outside air. The contractor can use methods such as wetting exposed asbestos-containing materials or providing exhaust controls to prevent asbestos emissions to the outside air. The structure being abated must also be isolated by containment barriers during removal operations, and a negative air pressure must be maintained within the containment barrier. The BAAQMD periodically inspects asbestos removal operations, and will typically inspect removal operations when a complaint has been received.

The local office of CalOSHA must be notified of work involving 100 square feet or more of asbestos-containing material work. The work must be conducted in accordance with the requirements Title 8 of the California Code of Regulations, Division 1, Chapter 3.2, Sections 341.6 through 341.17, and the asbestos requirements of the General Construction Safety Orders specified in Title 8 of the California Code of Regulations, Chapter 4, Subchapter 4, Article 4, Section 1529. To ensure adequate compliance with these regulatory requirements, asbestos removal contractors must be certified as such by the Contractors Licensing Board of the State of California.

Lead in Construction Standard

CalOSHA's Lead in Construction Standard (contained in Title 8 of the California Code of Regulations, Section 1532.1) addresses the demolition, removal, cleanup, transportation, storage, and disposal of lead-containing material. The regulations outline the permissible exposure limit, protective measures, monitoring requirements, and compliance standards to ensure the safety of construction workers exposed to lead-based materials. CalOSHA's Lead in Construction Standard requires project proponents to develop and implement a lead compliance plan when lead-based paint would be disturbed during construction. The plan must describe activities that could emit lead, methods for complying with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. CalOSHA requires 24-hour notification if more than 100 square feet of lead-based paint would be disturbed.

Cleanup of PCBs

The RWQCB has established a residential Environmental Screening Level of 0.22 mg/kg for soil,[83] and this is the criterion used in the Pier 70 RMP for the evaluation of risks associated with residential land uses. The commercial Environmental Screening Level for PCBs is 0.74 mg/kg.

Disposal of Fluorescent Light Ballasts

Most fluorescent light ballasts manufactured before 1978 contain PCBs in their capacitor and potting material. Ballasts manufactured after January 1, 1978, do not contain PCBs and should be labeled as such on the ballast. California requirements for management of fluorescent light ballasts containing PCBs are specified in Title 22 of the California Code of Regulations, Division 4.5, Chapter 42. In accordance with these regulations, generators who transport no more than two 55-gallon drums of PCB-containing ballasts per transportation vehicle are exempt from California regulatory requirements for generators of hazardous waste. The transporter of the ballasts must meet certain regulatory requirements, depending on the number of ballasts transported in one load. In accordance with Title 40 of the Code of Federal Regulations, Section 761.60, fluorescent light ballasts with PCBs in their potting material must be disposed of in an approved landfill or decontaminated.

Between 1979 and the early 1990s, DEHP was used in place of PCB as a dielectric fluid in some fluorescent light ballasts and other electrical equipment.[84] DEHP is classified as a probable

[83] California Regional Water Quality Control Board, San Francisco Bay Region. Update to Environmental Screening Levels. Interim final, December 23, 2013.

[84] Green Lights Recycling, Inc., *Ballasts.* Available online at http://glrnow.com/ballasts/. Accessed November 23, 2015.

human carcinogen by the U.S. Department of Health and Human Services[85] and as a hazardous substance by the EPA in accordance with Title 40 of the Code of Federal Regulations, Chapter I, Subchapter I, Part 261, Subpart D, Section 261.33. Because of this, ballasts containing DEHP must be legally disposed of or recycled and are commonly handled in the same manner as PCB ballasts.

Disposal of Mercury-Containing Equipment

Spent fluorescent lamps and tubes commonly contain mercury vapors. These, and electrical switches that contain mercury, are considered a hazardous waste in California under Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Section 66261.50. Because they are considered a hazardous waste, all fluorescent lamps and mercury-containing switches must be recycled or taken to a universal waste handler.

Naturally Occurring Asbestos

Asbestos-containing material is defined in Title 17 of the California Code of Regulations Section 93105(h)(9) as any material that has an asbestos content of 0.25 percent or greater. In 2001, the CARB adopted the Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations in areas of serpentine and other ultramafic rocks (contained in Title 17 of the California Code of Regulations, Section 93105), which became effective in July 2002. The ATCM protects public health and the environment by requiring the use of best available dust mitigation measures to prevent the offsite migration of asbestos-containing dust from road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas of ultramafic rock, serpentine, or naturally occurring asbestos. The BAAQMD implements the regulation.

For construction activities that would disturb more than 1 acre of land where asbestos-containing materials are present, construction contractors are required to prepare an asbestos dust mitigation plan specifying measures that will be taken to ensure that no visible dust crosses the property boundary during construction. The asbestos dust mitigation plan must be submitted to and approved by the BAAQMD prior to the beginning of construction, and the site operator must ensure the implementation of all specified dust mitigation measures throughout the construction project. In addition, the BAAQMD may require air monitoring for offsite migration of asbestos dust during construction activities and may change the plan on the basis of the air monitoring results. The BAAQMD may provide an exemption from the requirements of the Asbestos ATCM if a geologic evaluation by a professional geologist determines that no serpentine or ultramafic

[85] U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, *Substances Listed in the Thirteenth Report on Carcinogens*, 2014. Available online at http://ntp.niehs.nih.gov/ntp/roc/content/listed_substances_508.pdf. Accessed June 2, 2016.

rock is likely to be found in the area to be disturbed. A construction contractor engaged in construction activities within materials containing naturally occurring asbestos would also be required to comply with the work practices and personnel exposure monitoring requirements specified in Title 8 of the California Code of Regulations, Section 1529.

Methane Control

Title 27 of the California Code of Regulations includes requirements for the control of methane from waste disposal units. In accordance with Section 20921, Gas Monitoring and Control, to provide for the protection of public health and safety and the environment, the disposal site operator must ensure that landfill gas generated at a disposal site is controlled in such a manner that the concentration of methane gas does not exceed 1.25 percent by volume in air within any portion of any on-site structures. The project site is not a landfill; however, this criterion is used by DPH to determine if additional monitoring of methane concentrations or implementation of gas migration controls is required.[86]

Hazardous Waste Tracking and Transportation

Title 40 of the Code of Federal Regulations, Section 260.10, defines the "Generator" of hazardous waste as the person or entity whose action produces a waste or causes a hazardous waste to become subject to regulation. Generators of hazardous wastes are subject to the regulatory requirements of the California Department of Toxic Substances Control. In accordance with Title 22 of the California Code of Regulations, Division 4.5, Chapter 12, the generator of hazardous waste must have a Hazardous Waste Generator Number assigned by and registered with the State of California Department of Toxic Substances Control.

Regulatory requirements for the transport of hazardous wastes in California are specified in Title 22 of the California Code of Regulations, Division 4.5, Chapters 13 and 29. In accordance with these regulations, all hazardous waste transporters must have identification numbers. Hazardous waste transporters must comply with the California Vehicle Code, California Highway Patrol regulations (contained in Title 13 of the California Code of Regulations); the California State Fire Marshal regulations (contained in Title 19 of the California Code of Regulations); DOT regulations (Title 49 of the Code of Federal Regulations); and EPA regulations (contained in Title 40 of the Code of Federal Regulations).

[86] California Regional Water Quality Control Board, Letter to Mr. Scott Nakamura, City and County of San Francisco Department of Public Health, *Subject: Clarification of the AB2061 Process, Clarification of the California Integrated Waste Management Board (CIWMB) Letter Dated April 4, 2001, and Development of a Protocol for Management of Methaned, Mission Bay Project Area, City and County of San Francisco*, May 15, 2001.

A hazardous waste manifest is required for transport of hazardous wastes. The hazardous waste manifest documents the legal transport and disposal of the waste, and is signed by the generator and transporter(s) of the waste as well as the disposal facility. California regulations require specific cleanup actions that must be taken by a hazardous waste transporter in the event of a discharge or spill, and for the safe packaging and transport of hazardous wastes.

LOCAL

San Francisco Health Code – Hazardous Materials and Hazardous Wastes

The City and County of San Francisco has enacted local ordinances and regulations to address the potential to encounter hazardous materials in the soil, groundwater, and hazardous building materials, and to ensure the safe handling of hazardous materials and hazardous wastes. The following sections of the San Francisco Health Code, implemented by DPH as the Hazardous Materials Unified Program Agency and briefly summarized below, would apply to the Proposed Project to address the potential to encounter hazardous materials in the soil and the use of hazardous materials:

- Article 21 (Hazardous Materials) provides for safe handling of hazardous materials in the City. It requires any person or business that handles, sells, stores, or otherwise uses specified quantities of hazardous materials to keep a current certificate of registration and to implement a hazardous materials business plan (HMBP). Threshold quantities are 500 pounds for solids, 55 gallons for liquids, and 200 cubic feet for compressed gases. Every business that must implement an HMBP must also obtain a certificate of registration certifying that the HMBP meets the requirements of Article 21. This article also specifies requirements for the installation and operation of USTs, reporting of unauthorized releases, and closure of permitted facilities (including USTs). The closure of any UST must also be conducted in accordance with a permit from the San Francisco Fire Department.
- Article 21A (Risk Management Program) requires any business that handles, sells, stores, or otherwise uses regulated substances[87] in quantities exceeding specified threshold amounts to register with DPH and prepare an RMP. The RMP must be submitted to DPH before a Certificate of Occupancy can be issued. This article does not apply to the Proposed Project, because regulated substances would not be used during construction or operation.
- Article 22 (Hazardous Waste Management) provides for safe handling of hazardous wastes in the City. It authorizes DPH to implement the State hazardous waste regulations, including authority to conduct inspections and document compliance.
- Article 22A (Analyzing the Soils for Hazardous Waste, known as the Maher Ordinance and updated in 2013) applies to projects that involve disturbance of more than 50 cubic

[87] Regulated substances include those regulated under Section 68.130 of Title 40 of the Code of Federal Regulations, or those identified as an extremely hazardous substance in Appendix A of Part 355 of Title 40 of the Code of Federal Regulations, and those identified in Chapter 6.95, Article 2 of the California Health and Safety Code.

yards of soil, if they are located bayward of the historic high tide line, have been zoned or used for industrial purposes, are located within 150 feet of an elevated highway, have soil or groundwater contamination, or are within 100 feet of a known or suspected underground storage tank. In accordance with this article, covered projects must prepare a site history report to identify whether past site uses may have caused contamination, conduct soil and/or groundwater testing for the presence of the potentially hazardous constituents (including methane), prepare a soils analysis report, and prepare a Site Mitigation Plan (if contamination is identified).

If hazardous materials remain in the soil or groundwater, approval of the Site Mitigation Plan by DPH may be conditioned upon submittal of an RMP, health and safety plan, and possibly a cap maintenance plan to prevent exposure to hazardous materials in soil or groundwater after construction of the project. A deed restriction may also be required. Upon completion of site mitigation, the site owner must submit certification that the project has received certification or verification from the appropriate State or Federal agency that mitigation is complete, before DPH can issue a letter of no further action.

- Article 22B (Construction Dust Control Requirements) and San Francisco Building Code Section 106.A.3.2.6 collectively constitute the Construction Dust Control Ordinance which was adopted in July 2008. The ordinance applies to all site preparation work, demolition, or other construction activities within San Francisco that have the potential to create dust. Projects that expose or disturb more than 10 cubic yards or 500 square feet of soil must comply with specified dust control measures whether or not the activity requires a permit from the San Francisco Department of Building Inspection (DBI). For projects over 0.5 acre, the Dust Control Ordinance requires that the project sponsor submit a Dust Control Plan for approval by DPH prior to issuance of a building permit by the DBI. Building permits will not be issued without written notification from the Director of Public Health that the applicant has a site-specific Dust Control Plan, unless the Director waives the requirement.

  The Construction Dust Control Ordinance requires project sponsors and contractors responsible for construction activities to control construction dust on the site or to implement other practices that result in equivalent dust control. Dust suppression activities may include sufficient watering of all active construction areas to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code.

Port of San Francisco Building Code – Work Practices for Lead-Based Paint

Work that could result in disturbance of lead-based paint must comply with Section 3426 of the *Port of San Francisco Building Code*, Work Practices for Lead-Based Paint on Pre-1979 Buildings and Steel Structures. Where any work may disturb or remove lead paint on the exterior of any building built prior to 1979, Section 3426 requires specific notification and work standards, and identifies prohibited work methods and penalties. (Such notices are commonly placed on residential and other buildings in San Francisco that are undergoing re-painting. Generally affixed to a drape that covers all or portions of a building, these notices are a required part of the Section 3426 notification procedure.)

Section 3426 applies to the exterior of all buildings or steel structures on which original construction was completed prior to 1979 (which are assumed to have lead-based paint on their surfaces, unless demonstrated otherwise through sampling and laboratory analysis), and to the interior of residential buildings, hotels, and childcare centers. The ordinance contains performance standards, including requirements for restricting access during abatement activities; establishing containment barriers that are at least as effective at protecting human health and the environment as those in the U.S. Department of Housing and Urban Development Guidelines (the most recent Guidelines for Evaluation and Control of Lead-Based Paint Hazards); protecting the ground from contamination during exterior work; protecting floors and other horizontal surfaces from work debris during interior work; preventing migration of lead paint beyond containment barriers during the course of the work; and achieving clean-up standards. The clean-up standards require the removal of visible work debris, including the use of a HEPA vacuum following interior work. Section 3426 prohibits these work practices for the removal of lead-based paint: (1) open flame burning or torching; (2) heat guns without containment and barrier systems, or operating above 1,100 degrees Fahrenheit (611.1 degrees Celsius) or causing the charring of paint; (3) hydroblasting or high-pressure washing without containment and barrier systems; and (4) dry manual sanding or scraping, or machine sanding or grinding, or abrasive blasting or sandblasting without containment and barrier systems or a HEPA vacuum local exhaust tool.

The ordinance also includes notification requirements and requirements for signs. Prior to the commencement of work, the responsible party must provide written notice to the Port's Building Permit Group of the address and location of the project; the scope of work, including specific location within the site; methods and tools to be used; the approximate age of the structure; anticipated job start and completion dates for the work; whether the building is residential or nonresidential, owner-occupied or rental property; the dates by which the responsible party has fulfilled or will fulfill any tenant or adjacent property notification requirements; and the name, address, telephone number, and pager number of the party who will perform the work. Further notice requirements include a Post Sign notifying the public of restricted access to work area; a Notice to Residential Occupants, Availability of Pamphlet related to protection from lead in the home; and Notice of Early Commencement of Work (by Owner, Requested by Tenant), and Notice of Lead Contaminated Dust or Soil, if applicable. Section 3426 contains provisions regarding inspection and sampling for compliance by the Port, as well as enforcement, and describes penalties for non-compliance with the requirements of the ordinance.

Port of San Francisco Building Code – Asbestos Abatement

Section 3425 of the Port of San Francisco Building Code addresses work practices for asbestos-containing materials. In accordance with this section, applicants for a building permit application are required to include an asbestos survey report with the building permit application. The

submittal must also identify the scope of asbestos removal; methods and tools for disturbance and/or removal of asbestos-containing materials; the start and end dates; dates by which the responsible party will fulfill notification requirements for the occupants and adjacent properties; and information regarding the party responsible for performing the asbestos abatement work. The Port is authorized to inspect any asbestos abatement work conducted in accordance with Section 3425 of the Port of San Francisco Building Code.

Emergency Response

The City's Emergency Response Plan addresses the roles and responsibilities of the City during hazards-related emergency response, in particular their interaction with regional, State, and Federal entities and the role of the San Francisco Emergency Operations Center and City agencies.[88] Integral to this plan, the Transportation Annex describes the procedures for assessment, identification of temporary alternative solutions, and restoration of damage to transportation systems, facilities, and infrastructure due to an emergency incident. To provide flexibility for incident response to select appropriate routing, the plan does not specify designated emergency response or evacuation routes.

San Francisco General Plan

The Community Safety Element of the *General Plan* includes Objective 1, which requires the City to "reduce structural and non-structural hazards to life safety and minimize property damage resulting from future disasters." The Community Safety Element contains the following relevant hazardous materials policies in support of this objective:

Policy 1.23	Enforce state and local codes that regulate the use, storage, and transportation of hazardous materials in order to prevent, contain, and effectively respond to accidental releases.
Policy 1.24	Educate public about hazardous materials procedures including transport, storage, and disposal.

The Community Safety Element of the *General Plan* also includes Objective 3, which requires the City to "establish strategies to address the immediate effects of a disaster." The Community Safety Element contains the following relevant emergency response and hazardous materials policies in support of this objective:

Policy 3.1	After an emergency, follow the mandates of the Emergency Response Plan and Citywide Earthquake Response Plan.

[88] CCSF Emergency Management Program, *City and County of San Francisco Emergency Response Plan.* 2010. A copy of this document is available online at http://www.sfdem.org/Modules/ShowDocument.aspx?documentid=1154. Accessed January 5, 2016.

Policy 3.12 Address hazardous material and other spills by requiring appropriate cleanup by property owners per local, state, and federal environmental laws.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on hazards and hazardous materials. Implementation of the Proposed Project would have a significant effect on hazards and hazardous materials if the project would:

P.1 Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

P.2 Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

P.3 Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

P.4 Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;

P.5 For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;

P.6 For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area;

P.7 Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

P.8 Expose people or structures to a significant risk of loss, injury, or death involving fires.

Due to the nature of the Proposed Project, there would be no impact related to safety hazards in the vicinity of a public airport or private airstrip, Criteria P.5 and P.6. This is because the nearest airports to the project site are San Francisco International Airport approximately 8.5 miles to the south and Oakland International Airport approximately 9.5 miles to the southeast, and development under the Proposed Project would not interfere with air traffic.

APPROACH TO ANALYSIS

This analysis evaluates the Proposed Project's potential effects related to hazards and hazardous materials during construction and operation as discussed below. Potential hazardous materials effects are assessed with respect to exposure of people to hazardous materials present in the soil and groundwater, including those from past site activities and naturally occurring asbestos. The impact analysis assumes that all construction and operational activities would be completed in compliance with the Pier 70 RMP and Hoedown Yard SMP and the requirements of applicable regulations. Because of the potential for exposure to hazardous materials in the soil and groundwater during construction and operation, impacts related to this topic would be significant and mitigation measures are included as needed to provide clarification regarding implementation of the requirements of the Pier 70 RMP and Hoedown Yard SMP. Regarding the routine use, transport, or disposal of hazardous materials during construction and operation, the analysis assumes that the Proposed Project would comply with applicable regulations which ensure that impacts related to these topics would be less than significant. Similarly, regarding fire and emergency planning, the impact analysis discusses applicable building and fire codes, and the City emergency response planning which ensure that impacts related to these topics would be less than significant.

PROJECT FEATURES

The specific Proposed Project elements that could result in hazards and hazardous materials impacts include proposed building demolitions (Buildings 11, 15, 16, 19, 25, 32, and 66) and renovations (Buildings 2, 12, and 21); proposed grading and excavation for the construction of basements on all parcels as well as improvements to Building 12; occupation of the new residential and commercial buildings; street improvements, including the new 21st Street; installation of new utilities for potable water, recycled water, fire protection water, wastewater, stormwater, electricity, and natural gas; and use of the Irish Hill Playground at the existing Irish Hill remnant.

Several features of the Proposed Project have the potential to encounter hazardous materials in the soil and groundwater based on their location, depth of excavation, and area of ground disturbance within the project site. Demolition of existing buildings could also encounter hazardous building materials used in their construction. These project features are the same or substantially similar under the Maximum Commercial Scenario and the Maximum Residential Scenario. In addition, the three stormwater and wastewater management options and the three options for grading around Building 12 that are analyzed in this EIR are generally the same relative to ground disturbance. To the extent that these features may differ slightly from one to another, they are generally included and accounted for in an analysis of maximum ground disturbance within the project site.

The same hazards and hazardous materials regulatory requirements and mitigation measures applicable to the Proposed Project are equally applicable under the Proposed Project's various scenarios and options. Therefore, this impact analysis of hazards and hazardous materials impacts applies to all project scenarios and options; no separate analysis of impacts under each scenario or option is necessary.

IMPACT EVALUATION

Impact HZ-1: Construction and operation of the Proposed Project would not create a significant hazard through routine transport, use, or disposal of hazardous materials. ***(Less than Significant)***

The Proposed Project would use common hazardous materials during both construction and operation. Impacts related to hazardous materials use during both construction and operation are discussed below along with regulations that are in place and ensure that impacts related to the use of hazardous materials would be less than significant.

Construction

During construction of the Proposed Project, diesel fuel and hazardous materials such as paints, fuels, solvents, and adhesives would be used, and an inadvertent release of large quantities of these materials into the environment could adversely affect soil and Bay water quality. As described in Section 4.O, Hydrology and Water Quality, and above in the discussion of the Pier 70 RMP and Hoedown Yard SMP requirements, the Proposed Project would be subject to the Construction General Stormwater Permit issued by the RWQCB, and an Erosion Control Plan would be required in accordance with Article 4.1 of the San Francisco Public Works Code. In accordance with these regulatory requirements, the project sponsors would be required to prepare and implement a Storm Water Pollution Prevention Plan and Erosion Control Plan to minimize construction-related water quality impacts.

The Storm Water Pollution Prevention Plan and Erosion Control Plan would identify hazardous materials sources within the construction area and recommend site-specific BMPs to prevent discharge of these materials into stormwater and Bay waters. The minimum BMPs that would be required include maintaining an inventory of materials used onsite; storing chemicals in water-tight containers protected from rain; developing a spill response plan and procedures to address hazardous and nonhazardous spills; maintaining spill cleanup equipment onsite; assigning and training spill response personnel; and preventing leaked oil, grease, and fuel from equipment from entering the storm drain or Bay. In accordance with the Construction General Permit, the project sponsors would be required to ensure that the construction site is visually inspected weekly, and daily during rain events, and to implement corrective actions if any shortcomings are

identified. If a discharge of pollutants to the Bay were indicated, the discharge would be sampled in accordance with the General Construction Permit.

Further, the vendors and contractors responsible for delivery of hazardous materials would comply with the regulations of the California Highway Patrol and the California Department of Transportation related to the transportation of hazardous materials during construction (described above under "State" in Regulatory Framework, pp. 4.P.46-4.P.47).

With implementation of these legal requirements, as they may be updated in the future, impacts related to the routine use, transport, and disposal of hazardous materials during construction would be less than significant. No mitigation measures are necessary.

Operation

Commercial businesses, offices, restaurants, and residential uses would use common types of hazardous materials such as cleaners, disinfectants, and chemical agents required to maintain the sanitation of the public use and residential areas as well as the commercial bathrooms and food preparation areas. These commercial products are labeled to inform users of potential risks and to instruct them in appropriate handling procedures. Arts and light industrial uses may also use some hazardous materials in their operations. In addition, as described in Section 4.G, Air Quality, building heights up to 90 feet would be allowed on 10 parcels (all on the 28-Acre Site): Parcels A, B, C1, C2, D, E1, F, G, H1, and H2. Each of the buildings proposed on these parcels would have a back-up generator that would operate in emergency situations and would require the use of diesel for operation; due to the anticipated larger size of a building that can be constructed on Parcel B, it is assumed that two generators will be installed, for a total of 11 generators on the project site. When tenant spaces are maintained, remodeled, or sold, the maintenance and renovation activities would also include the use of paints, glues, and other materials similar to those used during construction. Operations, including proposed commercial, retail, residential, arts, and light industrial uses (in particular), may also result in the production of minor amounts of hazardous waste requiring offsite disposition such as disposal or recycling.

However, as described above under "Local" in Regulatory Framework, pp. 4.P.47-4.P.48, the use and storage of hazardous materials would be required to comply with the requirements of Article 21 of the San Francisco Health Code, and the management of hazardous wastes would be required to be conducted in accordance with Article 22 of the San Francisco Health Code, which provides for the safe handling of hazardous materials and wastes in the City. In accordance with Article 21, any facility that handles hazardous materials, including hazardous wastes, in excess of specified quantities would be required to obtain a Certificate of Registration from DPH and to implement an HMBP that includes inventories, a program for reducing the use of hazardous materials and generation of hazardous wastes, site layouts, a program and implementation plan

for training all new employees and annual training for all employees, and emergency response procedures and plans. In accordance with Article 22, generators of hazardous waste are required to pay an annual fee to DPH, based on the quantity of hazardous wastes generated annually.

Further, the vendors responsible for delivery of hazardous materials would comply with the regulations of the California Highway Patrol and the California Department of Transportation related to the transportation of hazardous materials during construction (described above under "State" in Regulatory Framework, pp. 4.P.46-4.P.47).

With implementation of these regulatory requirements, as they may be updated in the future, impacts related to the routine use, transport, and disposal of hazardous materials during operation would be less than significant. No mitigation measures are necessary.

Impact HZ-2: Demolition and renovation of buildings under the Proposed Project would not expose workers and the public to hazardous building materials including asbestos-containing materials, lead-based paint, bis (2-ethylhexyl) phthalate (DEHP), and mercury, or result in a release of these materials into the environment during construction. However, workers and the public would be exposed to PCBs as a result of the removal of electrical transformers *(Less than Significant with Mitigation)*

Construction

As described above under "Hazardous Building Materials," pp. 4.P.37-4.P.39, Building 21 was constructed in approximately 1900. All of the other existing buildings at the project site were constructed between 1937 and 1945. Previous surveys for hazardous building materials have identified asbestos-containing materials and lead-based paint in Building 11 which would be demolished under the Proposed Project. Based on their age, these hazardous building materials are likely present in Buildings 15, 16, 19, 25, 32, and 66 which also would be demolished under the Proposed Project. Similarly, previous surveys for hazardous building materials have identified asbestos-containing materials and lead-based paint in Buildings 2, 12, and 21, all of which would be renovated under the Proposed Project. The Phase I ESA for the Proposed Project also noted PCB-containing light ballasts and mercury switches and thermostats in most buildings in 2011 as well as PCB-containing transformers in several locations. In addition, the Phase I ESA noted that pipes associated with the historic distribution of steam are likely to include transite materials. Other existing utility systems could include asbestos in their coatings, gaskets, or other features.

Workers and the public could be exposed to hazardous building materials if they were not removed or abated prior to demolition or renovation of the existing buildings and utility systems. As described above under "State" and "Local" in Regulatory Framework on pp. 4.P.41-4.P.51,

there is a well-established regulatory process that must be followed for ensuring adequate abatement of these materials prior to building demolition or renovation.

Asbestos-Containing Materials. In accordance with BAAQMD Rule 11, Regulation 2 (discussed above under "State" in Regulatory Framework), the project sponsors would be required to retain a qualified contractor to conduct a survey to identify asbestos-containing materials in any building planned for demolition or renovation and in any utility systems that would be demolished. If asbestos-containing materials are identified, the project sponsors would retain a qualified asbestos removal contractor certified as such by the Contractors Licensing Board of the State of California to remove the regulated materials prior to demolition or alteration activities. During removal activities, the contractor would implement controls to ensure that there are no visible asbestos emissions to the outside air. This may include methods such as wetting exposed asbestos-containing materials or providing exhaust controls to prevent asbestos emissions to the outside air; and constructing a containment barrier around the building and maintaining negative air pressure within the containment barrier. The removal activities would be conducted in accordance with the State regulations contained in Title 8 of the California Code of Regulations, Section 1529, and Title 8 of the California Code of Regulations, Sections 341.6 through 341.17. The owner of the property would dispose of the asbestos-containing materials at a permitted disposal facility under the Port's Hazardous Waste Generator Number. The contractor and hauler of the material are required to file a Hazardous Waste Manifest which details the hauling of the material from the site and the disposal of it. Pursuant to California law, the Port would not issue the building demolition or renovation permit until the project sponsors have complied with the notice and abatement requirements described above.

Section 3425 of the Port of San Francisco Building Code also addresses work practices for asbestos-containing materials. In accordance with this section, the project sponsors would be required to include an asbestos survey report with the building permit application for any subsequent development. The submittal must also identify the scope of asbestos removal; methods and tools for disturbance and/or removal of asbestos-containing materials; the start and end dates; dates by which the responsible party will fulfill notification requirements for the occupants and adjacent properties; and information regarding the party responsible for performing the asbestos abatement work. The Port is authorized to inspect any asbestos abatement work conducted in accordance with Section 3425 of the Port of San Francisco Building Code.

Compliance with the regulatory requirements described above and implementation of the required procedures prior to building demolition or renovation would ensure that potential impacts due to demolition or renovation of structures with asbestos-containing materials would be less than significant. No mitigation measures are necessary.

Lead-Based Paint. Because all of the buildings that would be demolished or renovated were constructed prior to 1979, and could contain lead-based paint, the project sponsors would be required to implement the requirements of Section 3426 of the Port of San Francisco Building Code, Work Practices for Lead-Based Paint on Pre-1979 Buildings and Steel Structures (described above under "Local" in Regulatory Framework, pp. 4.P.48-4.P.49). Accordingly, the project sponsors would retain a qualified contractor to abate the lead-based paint prior to demolition or renovation of any buildings. Prior to demolition or renovation, the contractor would conduct the required notifications. During demolition, the contractor would establish containment barriers that are at least as effective at protecting human health and the environment as those in the U.S. Department of Housing and Urban Development Guidelines (the most recent Guidelines for Evaluation and Control of Lead-Based Paint Hazards); protect the ground from contamination during exterior work; protect floors and other horizontal surfaces from work debris during interior work; and make all reasonable efforts to prevent migration of lead paint beyond containment barriers during the course of the work. At the completion of abatement activities, the contract would demonstrate compliance with the clean-up standards of Section 3426 that require removal of visible work debris, including the use of a HEPA vacuum following interior work. Pursuant to Section 3426, the Port would not issue the building demolition or renovation permit until the project sponsors have complied with the requirements described above.

Demolition of other structures that include lead-containing materials and renovation of the interiors of Buildings 2, 12, and 21 could also result in exposure of workers and the public to lead. However, these activities would be subject to the CalOSHA Lead in Construction Standard (Title 8 of the California Code of Regulations, Section 1532.1) described above in "State" in Regulatory Framework. This standard requires development and implementation of a lead compliance plan when materials containing lead would be disturbed during construction. The plan must describe activities that could emit lead, methods that will be used to comply with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Measures to reduce and maintain low levels of worker exposure to lead include implementing good housekeeping practices, providing adequate hand and face washing facilities, providing worker training, and using proper respirators. CalOSHA would require 24-hour notification if more than 100 square feet of materials containing lead would be disturbed.

Any lead-based paint during abatement activities would be consolidated, and disposed of at a permitted facility in accordance with applicable law. Implementation of procedures required by Section 3426 of the Port of San Francisco Building Code and the Lead in Construction Standard, along with legal disposal of the lead-based paint by the project sponsors would ensure that potential impacts of demolition or renovation of structures with lead-based paint would be less than significant. No mitigation measures are necessary.

Electrical Transformers. As noted in the Environmental Setting on pp. 4.P.36-4.P.37, electrical transformers are present in at least two locations of the 28-Acre Site, including Building 21 which houses an operating electrical substation and Building 12 where a PCB-containing transformer was observed in a utility room during the 2011 Phase I ESA conducted for the 28-Acre Site in support of the Proposed Project. However, a complete survey of electrical transformers present at the site, and their PCB content, has not been conducted. If a PCB transformer is present in a building that would be demolished, a release of PCBs could occur, potentially exposing workers and the public to PCBs, or resulting in a release of PCBs to the environment. Both Buildings 12 and 21 would be reused for retail-light industrial-arts purposes under the Proposed Project. If a release of PCB-containing dielectric fluid has occurred, future occupants of the building could be exposed to residual PCBs in the building or in the soil if a release has affected soil. Therefore, impacts related to the potential release of PCBs from existing transformers at the site would be significant, if not mitigated.

This impact would be reduced to a less-than-significant level with implementation of Mitigation Measures M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers; M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed; and M-HZ-2c: Conduct Soil Sampling if Stained Soil Is Observed, requiring the project sponsors to retain a qualified contractor to conduct a survey of buildings and structures planned for demolition or renovation for PCB transformers, remove any identified PCB transformers in accordance with applicable laws and regulations, and conduct subsequent sampling and clean up if a release of PCB-containing dielectric fluid is indicated.

Mitigation Measure M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers

The project sponsors shall retain a qualified contractor to survey any building and/or structure planned for demolition, renovation, or relocation to identify all electrical transformers in use and in storage. The contractor shall determine the PCB content using name plate information, or through sampling if name plate data do not provide adequate information regarding the PCB content of the dielectric equipment. The project sponsors shall retain a qualified contractor to remove and dispose of all transformers in accordance with the requirements of Title 40 of the Code of Federal Regulations, Section 761.60 (described under Regulatory Framework) and Title 22 of the California Code of Regulations, Section 66261.24. The removal shall be completed in advance of any building or structural demolition, renovation, or relocation.

Mitigation Measure M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed

In the event that leakage is observed in the vicinity of a transformer containing greater than 50 parts per million PCB (determined in accordance with Mitigation Measure H-HZ-2a), or the leakage has resulted in visible staining of the building materials or surrounding surface areas, the project sponsors shall retain a qualified professional to obtain samples

of the building materials for the analysis of PCBs in accordance with Part 761 of the Code of Federal Regulations. If PCBs are identified at a concentration of 1 part per million, then the project sponsors shall retain a contractor to clean the surface to a concentration of 1 part per million or less in accordance with Title 40 of the Code of Federal Regulations, Section 761.61(a). The sampling and cleaning shall be completed in advance of any building or structural demolition, renovation, or relocation.

Mitigation Measure M-HZ-2c: Conduct Soil Sampling if Stained Soil Is Observed

In the event that leakage is observed in the vicinity of a PCB-containing transformer that has resulted in visible staining of the surrounding soil (determined in accordance with Mitigation Measure M-HZ-2a), the project sponsors shall retain a qualified professional to obtain soil samples for the analysis of PCBs in accordance with Part 761 of the Code of Federal Regulations. If PCBs are identified at a concentration less than the residential Environmental Screening Level of 0.22 milligram per kilogram, then no further action shall be required. If PCBs are identified at a concentration greater than or equal to the residential Environmental Screening Level of 0.22 milligrams per kilogram, then the project sponsors shall require the contractor to implement the requirements of the Pier 70 RMP, as required by Mitigation Measure M-HZ-6. The sampling and implementation of the Pier 70 RMP requirements shall be completed in advance of any building or structural demolition, renovation, relocation, or subsequent development.

Other Hazardous Building Materials. Other hazardous building materials that are likely present within the buildings to be demolished or renovated include fluorescent light ballasts that could contain PCBs or DEHP, fluorescent lamps that contain mercury vapors, and electrical switches and thermostats that also contain mercury. Disruption or disturbance of these materials could pose health threats for construction workers if not properly disposed of. However, prior to demolition or renovation, the project sponsors, through their contractor, would remove these items and dispose of them in accordance with the established State Regulatory Framework described above. Therefore, through compliance with regulatory requirements, impacts related to exposure to PCBs, DEHP, and mercury in these materials would be less than significant. No mitigation measures are necessary.

Operation

Buildings 2, 12, and 21 would be renovated and reused under the Proposed Project. These buildings are known to include asbestos-containing materials and lead-based paint as well as other hazardous building materials such as fluorescent lamps, PCB-containing light ballasts, and mercury switches and thermostats. However, these materials would be abated and/or removed during the construction phase of the Proposed Project, prior to reuse of the buildings, as discussed above. Although electrical transformers are also present in Buildings 12 and 21, and release of PCB-containing oil from these transformers could have potentially contaminated building surfaces, the transformers would be removed and the surfaces would be cleaned during the construction phase of the Proposed Project in accordance with Mitigation Measures M-HZ-2a and

M-HZ-2b, pp. 4.P.58-4.P.59. Soil containing PCBs would be managed in accordance with the Pier 70 RMP as specified in Mitigation Measure M-HZ-2c, p. 4.P.59. Therefore, site occupants and the public would not be exposed to hazardous building materials during operation of the Proposed Project, and this impact would be less than significant.

Impact HZ-3: Project development within the 28-Acre Site and 20th/Illinois Parcel would be conducted on a site included on a government list of hazardous materials sites and could encounter hazardous materials in the soil and groundwater, creating a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. ***(Less than Significant with Mitigation)***

As discussed in the Environmental Setting, the *Pier 70 Preferred Master Plan* area (including the 20th/Illinois Parcel, the 28-Acres Site, and Sims Metals and Auto Return which are two businesses formerly operated within the 28-Acre Site) is identified on several lists of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Numerous site investigations have been completed for both the 28-Acre Site and the 20th/Illinois Parcel, located within the *Pier 70 Preferred Master Plan* area, and these investigations have identified chemicals in the soil and groundwater. Groundwater monitoring wells also could be located within the *Pier 70 Preferred Master Plan* area, or new wells could be constructed in the future as part of remedial activities at the project site or other project activities. These wells could be damaged during construction.

Exposure to Chemicals in Soil and Groundwater during Construction

During development, including excavation for new structures, utilities, and shoreline improvements, construction workers could be exposed to chemicals in the soil, including naturally occurring asbestos, and groundwater through skin contact with the soil or groundwater, ingestion of the soil, or inhalation of airborne dust or vapors. The public, including students and staff at nearby schools as well as occupants of off-site residences and developments on adjacent parcels that have previously been developed, could be exposed to these chemicals through inhalation of airborne dust, contact with accumulated dust, and contaminated runoff. Therefore, impacts related to exposure to chemicals in the soil and groundwater during construction would be significant if not mitigated. The Pier 70 RMP specifies risk management procedures that must be implemented during development activities, described in the Environmental Setting section on pp. 4.P.17-4.P.18, to ensure the protection of construction workers and the public, and to ensure that contaminated materials are appropriately disposed of. Implementation of these measures in accordance with Mitigation Measure M-HZ-3a: Implement Construction and Maintenance-Related Measures of the Pier 70 Risk Management Plan, shown below, would reduce this impact

to a less-than-significant level. The deed restriction prepared and enforced by the RWQCB for the *Pier 70 Preferred Master Plan* area also incorporates these requirements of the Pier 70 RMP.

Mitigation Measure M-HZ-3a: Implement Construction and Maintenance-Related Measures of the Pier 70 Risk Management Plan

The project sponsors shall provide notice to the RWQCB, DPH, and Port in accordance with the Pier 70 RMP, in advance of ground-disturbing activities that would disturb an area of 1,250 square feet or more of native soil, 50 cubic yards or more of native soil, more than 0.5 acre of soil, or 10,000 square feet or more of durable cover (Pier 70 RMP Sections 4.1, 4.2, and 6.3).

The project sponsors shall also (through their contractor) implement the following measures of the Pier 70 RMP during construction to provide for the protection of worker and public health, including nearby schools and other sensitive receptors, and to ensure appropriate disposition of soil and groundwater removed from the site:

- A project-specific health and safety plan (Pier 70 RMP Section 6.4);
- Access controls (Pier 70 RMP Section 6.1);
- Soil management protocols, including those for:
  - soil movement (Pier 70 RMP Section 6.5.1),
  - soil stockpile management (Pier 70 RMP Section 6.5.2), and
  - import of clean soil (including preparation of a project-specific Soil Import Plan) (Pier 70 RMP Section 6.5.3);
- A dust control plan in accordance with the measures specified by the California Air Resources Board for control of naturally occurring asbestos (Title 17 of California Code of Regulations, Section 93105) and Article 22B of the San Francisco Health Code and other applicable regulations as well as site-specific measures (Pier 70 RMP Section 6.6);
- A project-specific stormwater pollution prevention control plan (Pier 70 RMP Section 6.7);
- Off-site soil disposal (Pier 70 RMP Section 6.8);
- A project-specific groundwater management plan for temporary dewatering (Pier 70 RMP Section 6.10.1);
- Risk management measures to minimize the potential for new utilities to become conduits for the spread of groundwater contamination (Pier 70 RMP Section 6.10.2);
- Appropriate design of underground pipelines to prevent the intrusion of groundwater or degradation of pipeline construction materials by chemicals in the soil or groundwater (Pier 70 RMP Section 6.10.3); and
- Protocols for unforeseen conditions (Pier 70 RMP Section 6.9).

Following completion of construction activities that disturb any durable cover, the integrity of the previously existing durable cover shall be re-established in accordance with Section 6.2 of the Pier 70 RMP and the protocols described in the Operations and Maintenance Plan of the Pier 70 RMP.

All plans prepared in accordance with the Pier 70 RMP shall be submitted to the RWQCB, DPH, and/or Port for review and approval in accordance with the notification requirements of the RMP (Pier 70 RMP Section 4.0).

Damage of Groundwater Monitoring Wells

If groundwater monitoring wells are damaged during construction, they could potentially create a conduit for downward migration of chemicals in the overlying soil, potentially degrading groundwater quality. This would be a significant impact. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HZ-3b: Implement Well Protection Requirements of the Pier 70 Risk Management Plan, requiring a review of available information to determine the presence of absence of wells, implementation of the well protection and destruction requirements of the Pier 70 RMP, and replacement of monitoring wells that are destroyed, if necessary. The deed restriction prepared and enforced by the RWQCB for Pier 70 also incorporates these requirements of the Pier 70 RMP.

Mitigation Measure M-HZ-3b: Implement Well Protection Requirements of the Pier 70 Risk Management Plan

In accordance with Section 6.11 of the Pier 70 RMP, the project sponsors shall review available information prior to any ground-disturbing activities to identify any monitoring wells within the construction area. The wells shall be appropriately protected during construction. If construction necessitates destruction of an existing well, the destruction shall be conducted in accordance with California and DPH well abandonment regulations, and must be approved by the RWQCB. The Port shall also be notified of the destruction. If required by the RWQCB, DPH, or the Port, the project sponsor shall reinstall any groundwater monitoring wells that are part of the ongoing groundwater monitoring network.

Impact HZ-4: Project development within the Hoedown Yard would be conducted on a site included on a government list of hazardous materials sites and could encounter hazardous materials in the soil and groundwater, creating a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. ***(Less than Significant with Mitigation)***

As discussed in the Environmental Setting on pp. 4.P.9-4.P.10, the Hoedown Yard is included in the Voluntary Cleanup Program database as part of the Potrero Power Plant. Several environmental investigations have identified chemicals in the soil and groundwater at the Hoedown Yard which is within the Illinois Parcels. During project construction, including excavation for new structures and utilities, construction workers could be exposed to chemicals in the soil and groundwater through skin contact with the soil or groundwater, ingestion of the soil, or inhalation of airborne dust. The public, including students and staff at nearby schools and occupants of adjacent parcels that have been previously developed, could be exposed to these

chemicals through inhalation of airborne dust, contact with accumulated dust, and contaminated runoff. Therefore, impacts related to exposure to chemicals in the soil and groundwater during construction at the Hoedown Yard would be significant, if not mitigated. This property is owned by PG&E, and a separate SMP has been prepared and approved by the RWQCB for development of this site. The Hoedown Yard SMP specifies measures that must be implemented during development activities, as described in the Environmental Setting, to ensure the protection of construction workers and the public, and to ensure that contaminated materials are appropriately disposed of. Implementation of these measures in accordance with Mitigation Measure M-HZ-4: Implement Construction-Related Measures of the Hoedown Yard Site Management Plan, shown below, would reduce this impact to a less-than-significant level. Implementation of the Hoedown Yard SMP requirements is enforced by the RWQCB through the deed restriction recorded on the property in 2012, described on p. 4.P.34.

Mitigation Measure M-HZ-4: Implement Construction-Related Measures of the Hoedown Yard Site Management Plan

In accordance with the notification requirements of the Hoedown Yard SMP (Section 4.2), the project sponsors (through their contractor) shall notify the RWQCB, DPH, and/or Port prior to conducting any intrusive work at the Hoedown Yard. During construction, the contractor shall implement the following measures of the Hoedown Yard SMP to provide for the protection of worker and public health, and to ensure appropriate disposition of soil and groundwater.

- A project-specific Health and Safety Plan (Hoedown Yard SMP Section 5):
  - Dust management measures in accordance with the measures specified by the California Air Resources Board for control of naturally occurring asbestos (Title 17 of California Code of Regulations, Section 93105) and Article 22B of the San Francisco Health Code. The specific measures must address dust control (SMP Section 6.1) and dust monitoring (SMP Section 6.2).
- Soil and water management measures, including:
  - soil handling (Hoedown Yard SMP Section 7.1.1),
  - stockpile management (Hoedown Yard SMP Section 7.1.2),
  - on-site reuse of soil (Hoedown Yard SMP Section 7.1.3),
  - off-site soil disposal (Hoedown Yard SMP Section 7.1.4),
  - excavation dewatering (Hoedown Yard SMP Section 7.1.5),
  - stormwater management (Hoedown Yard SMP Section 7.1.6),
  - site access and security (Hoedown Yard SMP Section 7.1.7), and
  - unanticipated subsurface conditions (Hoedown Yard SMP Section 7.2).

Impact HZ-5: Operation of the Proposed Project within the PG&E Responsibility Area would expose residents, site workers, and site visitors to hazardous materials in the soil, creating a significant hazard to the public or the environment. ***(Less than Significant with Mitigation)***

As described in the Environmental Setting on pp. 4.P.15-4.P.16, site investigations conducted by the Port and PG&E identified two localized areas in the southeast portion of the 28-Acre Site where the accumulated DNAPL is at least 1 foot thick or has accumulated in areas of discontinuous DNAPL.[89] The area of both continuous and discontinuous DNAPL, referred to as the PG&E Responsibility Area, is shown on Figure 4.P.1, p. 4.P.3. Parcel H2, the eastern portion of Parcel H1, and the southeast corner of Parcel E3 of the project site are included within this area.

As the responsible party for the contamination, PG&E will be conducting site remediation with regulatory oversight by the RWQCB that involves excavating the continuous DNAPL areas at the southernmost slipway to a depth of about 23 feet and backfilling the excavations with clean fill.[90] Durable cover(s), consisting of pavement, hardscape, or clean fill and vegetation over a demarcation layer, will be installed over the excavated and backfilled areas and the entire area containing discontinuous DNAPL to prevent exposure to chemicals in the subsurface soil. An RMP will be prepared for controlling exposure to chemicals left in place during future use of the property and a deed restriction restricting future land uses will be issued.

PG&E anticipates completing these remediation activities by 2017,[91] prior to construction of the Proposed Project beginning in 2018. However, implementation of the remediation activities in the PG&E Responsibility Area is outside of the project sponsors' control. If PG&E's remediation activities are delayed, construction of the proposed development on Parcels H1, H2, and E3 could preclude implementation of the planned remediation and the presence of DNAPL would continue to threaten water quality, a significant impact. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HZ-5: Delay Development on Proposed Parcels H1, H2, and E3 Until Remediation of the PG&E Responsibility Area is Complete, requiring the project sponsors to ensure that project construction on Parcels H1, H2, and E3 does not begin until remediation activities in the PG&E Responsibility Area have been completed to the satisfaction of the RWQCB. Implementation of this measure would ensure that

[89] Discontinuous DNAPL refers DNAPL that is present as isolated droplets adhering to the soil matrix. These isolated droplets are not interconnected and there is no possibility for the DNAPL to flow.

[90] Haley & Aldrich, Report on the Northeast Area of the Former Potrero Power Plant and a Portion of the Southeast Area of Pier 70 Feasibility Study, Potrero Power Plant Site, San Francisco, California. December 20, 2012, Section 5.

[91] Pacific Gas & Electric web site, Potrero Power Plant, Cleanup Areas and Recent Activities. Available online at http://www.pge.com/en/about/environment/taking-responsibility/mgp/Potrero/cleanup-and-activities/index.page. Accessed December 11, 2015.

future site occupants and workers would not be exposed to residual DNAPL or associated vapors at levels that would cause substantial health risks.

Mitigation Measure M-HZ-5: Delay Development on Proposed Parcels H1, H2, and E3 Until Remediation of the PG&E Responsibility Area is Complete

The project sponsors shall not start construction of the proposed development or associated infrastructure on proposed Parcels H1, H2, and E3 until PG&E's remedial activities in the PG&E Responsibility Area within and adjacent to these parcels have been completed to the satisfaction of the RWQCB. During subsequent development, the project sponsors shall implement the requirements of the Pier 70 RMP within the PG&E Responsibility Area, as enforced through the recorded deed restriction.

Impact HZ-6: Operation of the Proposed Project within the 28-Acre Site and the 20th/Illinois Parcel would expose residents, site workers, and site visitors to hazardous materials in the soil or soil vapors, creating a significant hazard to the public or the environment. ***(Less than Significant with Mitigation)***

Once the site is developed, site occupants, visitors, and maintenance workers could be exposed to hazardous materials in the soil, if mitigation measures are not implemented. In addition, future residents potentially could be exposed to chemicals in the soil vapors or groundwater as a result of vapor intrusion, if mitigation measures are not implemented. These effects are discussed below.

Exposure to Hazardous Materials in Soil

As described the Environmental Setting on p. 4.P.14, previous sampling within the 28-Acre Site and 20th/Illinois Parcel which are part of the *Pier 70 Preferred Master Plan* area has found that chemical concentrations throughout the sites contain PAHs, metals, and/or TPH at concentrations exceeding residential, commercial, and/or recreational cleanup levels. Naturally occurring asbestos concentrations in the fill material within the *Pier 70 Preferred Master Plan* area range from less than 1 percent to 2 percent[92] indicating that much of the soil could be classified as asbestos-containing materials under the Asbestos ATCM because the asbestos concentration is greater than 0.25 percent.

To avoid unacceptable health risks associated with exposure to the soil by residents, site workers, and visitors, the Pier 70 RMP requires placement of a durable cover over the any soil with chemical concentrations greater than the cleanup level for the planned land use. The durable covers would prevent human exposure to the soil under normal conditions and can include features such as new or existing buildings, new or existing roadways and sidewalks, new and

[92] Treadwell & Rollo, Pier 70 Feasibility Study and Remedial Action Plan, p. 11.

existing hardscapes or paved parking areas, shoreline revetments, 6 inches of gravel overlying a demarcation layer, or landscaped areas covered with a minimum of 2 feet of clean imported soil.

However, maintenance workers would occasionally need to breach the durable cover to conduct repairs of utilities and other systems. This could result in exposure to chemicals in the soil beneath the durable cover, a significant impact. This impact would be reduced to less-than-significant level with implementation of Mitigation Measure M-HZ-3a, pp. 4.P.61-4.P.62, which requires implementation of the Pier 70 RMP risk management procedures that must be implemented when construction or maintenance activities would encounter contaminated soil beneath the durable cover. Implementation of these measures would ensure the protection of maintenance workers and the public, and would also ensure that contaminated materials are appropriately disposed of. The deed restriction for the *Pier 70 Preferred Master Plan* area also incorporates these requirements of the Pier 70 RMP.

Residential Exposure to Soil Vapors

In areas where groundwater and soil vapor concentrations exceed residential Environmental Screening Levels, building occupants in residential developments could be exposed to chemicals present in the soil vapors and groundwater as a result of vapor intrusion into the subsurface features of the building, resulting in a significant impact if mitigation measures are not implemented. The human health risk assessment for the project found that the groundwater and soil vapor concentrations were below risk-based cleanup levels for commercial land uses throughout the *Pier 70 Preferred Master Plan* area. However, the concentrations of chemicals detected in the soil vapor or groundwater exceeded residential cleanup levels in the groundwater or soil vapor at the following locations.

- Benzene in groundwater from one location adjacent to proposed Parcel E4 (sampling location SPSB-04); and
- Naphthalene in soil vapors from one location within proposed Parcel H1 (sampling location P8SG-01) and one location within proposed Parcel B (sampling location P6SGP-01).

Within the 20th Street Historic Core site, north of the project site, there is one location (sampling location B-01-TT) where TPH gasoline exceeded the residential cleanup level in groundwater and another location (sampling location P4SG-09) where benzene exceeded the residential clean up level in soil vapor. Because it is possible for soil vapors and groundwater to migrate, conditions within the Historic Core potentially could affect conditions within the project site, particularly within Parcels PKN and A.

If residential development is constructed at or near any of these locations, residents could be subjected to health risks, a significant impact unless mitigated. This impact would be reduced to

a less-than-significant level with implementation of Mitigation Measure M-HZ-6: Additional Risk Evaluations and Vapor Control Measures for Residential Land Uses, requiring additional risk evaluations and implementation of measures to ensure that unacceptable health risks would not occur. The need for such evaluations would be confirmed by the RWQCB, DPH, and Port based on site conditions at the time of development through their review of the notification submittals required under Mitigation Measure M-HZ-3a, pp. 4.P.61-4.P.62. Feasible methods to control exposure to soil vapors include actions such as installing a vapor barrier beneath the proposed structure or implementation of a vapor intrusion mitigation system to prevent the intrusion of soil vapors. If a barrier were used, all protrusions through the subsurface features (such as pipelines) would be sealed and a barrier constructed of impermeable materials such as high-density polyethylene would be constructed beneath the structure. An active vapor control system would include inducing a pressure gradient between the indoor air and the underlying soil to prevent the intrusion of soil vapors. This can be accomplished by creating a positive pressure inside the structure or a negative pressure in the underlying soil. Other measures to minimize risk to below the significance level may also be implemented. The deed restriction prepared and enforced by the RWQCB for Pier 70 also incorporates these requirements of the Pier 70 RMP.

Mitigation Measure M-HZ-6: Additional Risk Evaluations and Vapor Control Measures for Residential Land Uses

The notification submittals required under Mitigation Measure M-HZ-3a shall describe site conditions at the time of development. If residential land uses are proposed at or near locations where soil vapor or groundwater concentrations exceed residential cleanup standards for vapor intrusion (based on information provided in the Pier 70 RMP), this information shall be included in the notification submittal and the RWQCB and DPH will determine whether a risk evaluation is required. If required, the project sponsors or future developer(s) shall conduct a risk evaluation in accordance with the Pier 70 RMP. The risk evaluation shall be based on the soil vapor and groundwater quality presented in the Pier 70 RMP and the proposed building design. The project sponsors shall conduct additional soil vapor or groundwater sampling as needed to support the risk evaluation, subject to approval by the RWQCB and DPH.

If the risk evaluation demonstrates that there would be unacceptable health risks to residential users (i.e., greater than 1×10^{-6} incremental cancer risk or a non-cancer hazard index greater than 1), the project sponsors shall incorporate measures into the building design to minimize or eliminate exposure to soil vapor through the vapor intrusion pathway, subject to review and approval by the RWQCB and DPH. Appropriate vapor intrusion measures include, but are not limited to design of a safe building configuration that would preclude vapor intrusion; installation of a vapor barrier; and/or design and installation of an active vapor monitoring and extraction system.

If the risk evaluation demonstrates that vapor intrusion risks would be within acceptable levels (i.e., less than 1×10^{-6} incremental cancer risk or a non-cancer hazard index less than 1) under a project-specific development scenario, no additional action shall be required. (For instance, the project sponsors could locate all residential uses above the

first floor which, in some cases, could eliminate the potential for residential exposure to organic compounds in soil vapors.)

Impact HZ-7: Operation of the Proposed Project within the Hoedown Yard would expose residents, site workers, and site visitors to hazardous materials in the soil, creating a significant hazard to the public or the environment. ***(Less than Significant with Mitigation)***

As described in the Environmental Setting on p. 4.P.28, previous sampling within the Hoedown Yard has found that, based on future use of the Hoedown Yard for commercial or industrial purposes, arsenic is the primary chemical of concern identified in the soil. Arsenic was identified at concentrations greater than the site-specific background level of 11.5 mg/kg in samples from the shallow fill materials within an approximately 140- by 140-foot area in the northwest corner of the Hoedown Yard (see Figure 4.P.1, p. 4.P.3). The maximum concentration was 530 mg/kg. Some soil samples from within this area also contained lead, TPH diesel, and TPH motor oil at concentrations exceeding the screening criteria for commercial land uses. Naturally occurring asbestos was also identified in the fill materials at concentrations ranging from 0.50 percent to 6.30 percent, all of which exceeded the screening level of 0.25 percent used for the classification of asbestos-containing materials under the Asbestos ATCM.

Although the Hoedown Yard SMP addresses risk management measures necessary to manage site risks based on industrial use of the site by PG&E, the plan does not provide measures for redevelopment of the site, and does not address risks related to potential residential uses. Without additional evaluation and implementation of additional risk management measures, future site occupants and visitors of the residential and commercial land uses under the Proposed Project could be subjected to potential health risks as a result of contact with the site soil, a significant impact unless mitigated.

The Hoedown Yard SMP states that it may be necessary to modify the plan in the event of one of the following conditions.

- There is a change in property use;
- There is a change in understanding of environmental conditions (e.g., newly identified chemicals);
- A new intrusive activity is proposed that is not addressed by the SMP; or
- New legal or regulatory requirements are adopted.

Because the Proposed Project would result in a change in property use, the Hoedown Yard SMP would have to be modified to account for potential risks to future site occupants under the Proposed Project. Mitigation Measure M-HZ-7: Modify Hoedown Yard Site Mitigation Plan, shown below, requires the project sponsors to modify the Hoedown Yard SMP to address future land uses proposed as part of the Proposed Project. Implementation of this measure is required

by the deed restriction and would be overseen by the RWQCB, DPH, and Port, and would reduce this impact to a less-than-significant level.

Mitigation Measure M-HZ-7: Modify Hoedown Yard Site Mitigation Plan.

The project sponsors shall conduct a risk evaluation to evaluate health risks to future site occupants, visitors, and maintenance workers under the proposed land use within the Hoedown Yard. The risk evaluation shall be based on the soil, soil vapor, and groundwater quality data provided in the existing SMP and supporting documents and the project sponsors shall conduct additional sampling as needed to support the risk evaluation.

Based on the results of the risk evaluation, the project sponsors shall modify the Hoedown Yard SMP to include measures to minimize or eliminate exposure pathways to chemicals in the soil and groundwater, and achieve health-based goals (i.e., an excess cancer risk of 1×10^{-6} and a Hazard Index of 1) applicable to each land use proposed for development within the Hoedown Yard. At a minimum, the modified SMP shall include the following components:

- Regulatory-approved cleanup levels for the proposed land uses;
- A description of existing conditions, including a comparison of site data to regulatory-approved cleanup levels;
- Regulatory oversight responsibilities and notification requirements;
- Post-development risk management measures, including management measures for the maintenance of engineering controls (e.g., durable covers, vapor mitigation systems) and site maintenance activities that could encounter contaminated soil;
- Monitoring and reporting requirements; and
- An operations and maintenance plan, including annual inspection requirements.

The risk evaluation and proposed risk management plan shall be submitted to the RWQCB, DPH, and Port for review and approval prior to the start of ground disturbance.

Impact HZ-8: Operation of the Irish Hill Playground would expose site visitors to naturally occurring asbestos and naturally occurring metals, creating a significant hazard to the public or the environment. ***(Less than Significant with Mitigation)***

The Irish Hill Playground would consist of a 2-acre area south and east of the existing Irish Hill and would include children's play areas (play slope and play pad), a picnic grove, a lounging terrace, and planted slopes and pathways. The playground area would include relatively level areas to the east of and adjacent to the Irish Hill remnant.

As discussed in the Environmental Setting on p. 4.P.9, the Irish Hill remnant is composed of serpentinite bedrock of the Franciscan Complex. Serpentinite commonly contains naturally

occurring chrysotile and amphibole asbestos, fibrous minerals that can be hazardous to human health if they become airborne, as well as naturally occurring metals (i.e., arsenic, cadmium, copper, chromium, nickel, vanadium, and zinc). If visitors to the playground play on exposed bedrock or fill materials derived from the bedrock, they could cause naturally occurring asbestos and naturally occurring metals to become airborne. As a result, playground users, including young children, could be exposed to airborne asbestos fibers and/or potentially hazardous concentrations of naturally occurring metals, a significant impact unless mitigated. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HZ-8a: Prevent Contact with Serpentinite Bedrock and Fill Materials in Irish Hill Playground, requiring placement of clean fill in level portions of the playground and construction of barriers designed to preclude climbing directly on the Irish Hill remnant.

> **Mitigation Measure M-HZ-8a: Prevent Contact with Serpentinite Bedrock and Fill Materials in Irish Hill Playground**
>
> The project sponsors shall ensure that a minimum 2-foot-thick durable cover of asbestos-free clean imported fill with a vegetated cover is emplaced above serpentinite bedrock and fill materials in the level portions of Irish Hill Playground. The fill shall meet the soil criteria for clean fill specified in Table 4 of the Pier 70 RMP and included in Appendix F, Hazards and Hazardous Materials, of this EIR. Barriers shall be constructed to preclude direct climbing on the bedrock of the Irish Hill remnant. The design of the durable cover and barriers shall be submitted to DPH and the Port for review and approval prior to commencement of construction of the Irish Hill Playground.

Implementation of Mitigation Measure M-HZ8a would not result in any significant impacts to the contributory remnant of Irish Hill feature. While the level areas surrounding the remnant would be altered by installing a 2-foot-thick durable cover, it would not result in the removal of or substantial altering of the remnant of the contributory feature. Installation of barriers to preclude direct climbing on the remnant would continue to allow views into the site, and would not largely alter the appearance of Irish Hill.

Similarly, visitors to the Irish Hill Playground could be exposed to airborne naturally occurring asbestos and naturally occurring metals if they use the playground during ground-disturbing activities for construction on adjacent parcels or during the construction of the new 21st Street which would remove a portion of the northern spur of the Irish Hill remnant. This would also be a significant impact unless mitigated. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HZ-8b: Restrictions on the Use of Irish Hill Playground, which requires that the playground not be operational during ground-disturbing activities for construction of the new 21st Street and on the adjacent parcels (PKN, PKS, HDY-1, HDY2, C1, and C2).

Mitigation Measure M-HZ-8b: Restrictions on the Use of Irish Hill Playground

To the extent feasible, the project sponsors shall ensure that the Irish Hill Playground is not operational until ground-disturbing activities for construction of the new 21st Street and on the adjacent parcels (PKN, PKS, HDY-1, HDY2, C1, and C2) is completed. If this is not feasible, and Irish Hill Playground is operational prior to construction of the new 21st Street and construction on all adjacent parcels, the playground shall be closed for use when ground-disturbing activities are occurring for the construction of the new 21st Street and on any of the adjacent parcels.

Impact HZ-9: The Proposed Project would not handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Although construction activities would emit diesel particulate matter and naturally occurring asbestos, these emissions would not result in adverse effects on nearby schools. ***(Less than Significant)***

Section 15186 of the CEQA Guidelines requires that the environmental document for projects that are located within one quarter mile of a school address the use of extremely hazardous materials and hazardous air emissions. Certain consultation and notification requirements apply if either of these activities would result in a health or safety hazard to persons who would attend or work at a school.

The Proposed Project would be located within one-quarter mile of five schools:

- Dogpatch AltSchool, a transitional Kindergarten through 8th grade school located at 616 20th Street, about 140 feet to the northwest of the project site;
- Potrero Kids at Third, a preschool located at 810 Illinois Street, approximately 350 feet north of the project site boundary;
- La Piccola Scuola Italiana preschool, located at the 728 20th Street, approximately 470 feet northwest of the project site boundary;
- Friends of Potrero Nursery School at 1060A Tennessee Street, approximately 630 feet west of the project site boundary; and
- Dogpatch Alternative School at 2265 Third Street, about 250 feet to the northwest of the project site boundary.

The State of California defines extremely hazardous materials and other regulated substances in Section 25532 (i) of the Health and Safety Code. Construction of the Proposed Project would only use common hazardous materials: paints, solvents, cements, adhesives, and petroleum products (such as asphalt, oil, and fuel). None of these materials is considered extremely hazardous under the State's definition. Therefore, there is no impact related to the use of these materials within one-quarter mile of a school.

Toxic Air Contaminants that constitute hazardous air emissions are listed in Title 17 of the California Code of Regulations, Section 93000. As discussed in Section 4.G, Air Quality

(Impact AQ-3, pp. 4.G.62-4.G.69), construction equipment and vehicular traffic would emit diesel particulate matter (DPM) and fine particulate matter ($PM_{2.5}$) during construction. Additionally, emergency generators and vehicular traffic would emit DPM, $PM_{2.5}$, and some compounds or variations of reactive organic gases (ROGs) during operation. All of these compounds are Toxic Air Contaminants. However, the health risk assessment conducted for the Proposed Project indicates the primary source of these toxic air contaminants in the project area is background (existing) conditions. The increased cancer risks at nearby schools as a result of project-related emissions in combination with existing conditions would be 50 in one million as a result of construction emissions and 45 in one million as a result of operational emissions, neither of which is considered significant. Similarly, $PM_{2.5}$ concentrations at the nearest school would be 8.5 $\mu g/m^3$ which would not be considered significant. Further, implementation of Mitigation Measure M-AQ-1a: Construction Emissions Minimization, pp. 4.G.42-4.G.44, would reduce the construction-related emissions of DPM, and implementation of Mitigation Measure M-AQ-1b: Diesel Backup Generator Specifications, p. 4.G.45, would reduce emissions of DPM during operation.

As discussed in Impacts M-HZ-3 and M-HZ-4, construction activities at the 28-Acre Site, Illinois Parcels, and Hoedown Yard could disturb rock and soil that contain naturally occurring asbestos. Asbestos is also considered a Toxic Air Contaminant by the CARB. However, the project sponsors would implement the dust control measures of the Pier 70 RMP and Hoedown Yard SMP, including compliance with Article 22B or the San Francisco Health code (required by Mitigation Measures M-HZ-3a and M-HZ-4, pp. 4.P.61-4.P.62 and p. 4.P.63, respectively). Implementation of these measures would ensure that no visible dust crosses the property boundary during construction, and this would prevent adverse exposure of school occupants to airborne asbestos. Therefore, impacts related to emissions of Toxic Air Contaminants within one-quarter mile of a school would be less than significant and no mitigation is necessary.

Impact HZ-10: The Proposed Project would not expose people or structures to a significant risk of loss, injury, or death involving fires, nor would it impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. ***(Less than Significant)***

San Francisco and the Port of San Francisco ensure fire safety primarily through provisions of the San Francisco and Port of San Francisco Building Codes. Accordingly, the proposed developments would be required to comply with the applicable sections of these building codes that require several fire safety features, such as equipping the building with a fire protection system, constructing the building with noncombustible materials or with a fire-resistive design, and including fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions in the building. The final building plans would be reviewed by the San Francisco Fire Department or Port Fire Marshal (as well as the Chief Harbor Engineer) of the San Francisco Department of

Building Inspection to ensure conformance with these provisions. Consequently, the Proposed Project would not create a substantial fire hazard or increase the risk of fires above existing levels.

The Proposed Project could be subject to earthquake hazards as discussed in Section 4.N, Geology and Soils, and tsunami hazards as discussed in Section 4.O, Hydrology and Water Quality. Occupants of, and visitors to, the proposed developments would increase the temporary and permanent localized population along the waterfront. This increased population could contribute to congestion if an emergency evacuation were required in the event of one of these or other emergencies. Although not "adopted" by legislative action, the City has a published Emergency Response Plan, prepared by the Department of Emergency Management as part of the City's Emergency Management Program, which includes plans for hazard mitigation and disaster preparedness and recovery.[93] The Emergency Response Plan contains 16 "annexes" (similar to appendices) that cover a number of emergency topics. The Earthquake Annex, in particular, sets forth planning assumptions for a series of earthquakes of varying magnitudes on different faults, and sets forth procedures for assessment of damage and injuries, as well as operational response strategies in the event of a major earthquake. The Tsunami Annex specifies emergency response procedures in the event of a tsunami, as described in more detail in Section 4.O, Hydrology and Water Quality, pp. 4.O.17-4.O.20.

During a major earthquake, glass, and in some cases building cladding, may endanger those on the streets and sidewalks. However, the buildings that would be constructed under the Proposed Project would be subject to the most up-to-date building and structural standards, and this would reduce the potential for damage in the event of a major earthquake. Therefore, persons attending or living and working in and around the new buildings as well as those passing by would be relatively safer than those in some older existing buildings. The Proposed Project is required to include provisions for emergency response for visitors and residents of the completed project. These provisions would integrate and be compatible with existing emergency response plans, and would neither obstruct implementation of the City's Emergency Response Plan, nor interfere with emergency evacuation planning. Through compliance with the existing codes and regulations noted above and implementation of project provisions for emergency response that account for and are compatible with the City's Emergency Response Plan, impacts related to interference with emergency response or evacuation plans would be less than significant, and no mitigation is necessary.

[93] San Francisco Department of Emergency Management, *City and County of San Francisco Emergency Response Plan*, December 2009. Available online at http://www.sfdem.org/Modules/ShowDocument.aspx?documentid=1154. Accessed November 25, 2015.

Cumulative Impacts

Impacts from hazards and hazardous materials are generally site-specific and do not generally result in cumulative impacts unless the potentially cumulative projects are in close proximity to one another. Accordingly, the geographic scope of potential hazards and hazardous materials is limited to the project site and immediate vicinity and the cumulative analysis uses a list-based approach to analyze the effects of the project in combination with past, present, and probable future projects in the immediate vicinity. The analysis considers whether or not there would be a significant, adverse cumulative impact associated with project implementation in combination with past, present, and probable future projects in the immediate vicinity, and if so, whether or not the Proposed Project's contribution to the cumulative impact would be cumulatively considerable.

Impact C-HZ-1: The Proposed Project, in combination with other past, present or reasonably foreseeable future projects in the project vicinity, would not result in a considerable contribution to significant cumulative impacts related to hazards and hazardous materials. ***(Less than Significant)***

As discussed above, the Proposed Project would not result in any significant impacts with respect to hazards or hazardous materials that could not be mitigated to a less-than-significant level. All cumulative development in San Francisco would be subject to the same regulatory framework as the project for the transport, use, and storage of hazardous materials (Impact HZ-1) as well as the abatement of hazardous building materials (Impact HZ-2). Compliance with these existing regulations, including implementation of Mitigation Measures M-HZ-2a through M-HZ-2c, pp. 4.P.58-4.P.59, that address PCB transformers, would serve to ensure that cumulative impacts related to these topics are less than significant.

The Proposed Project could result in exposure to chemicals in the soil and naturally occurring asbestos and metals during construction (Impacts HZ-3 and HZ-4, pp. 4.P.60-4.P.62 and pp. 4.P.62-4.P.63, respectively), and cumulative projects in the area could also encounter these materials on their sites, potentially resulting in a significant cumulative impact related to exposure of the public and site occupants to contaminated materials. However, the project sponsors would implement Mitigation Measure M-HZ-3a, pp. 4.P.61-4.P.62, requiring implementation of the construction and maintenance-related measures of the Pier 70 RMP; Mitigation Measure M-HZ-3b, p. 4.P.62, requiring implementation of the well protection requirements of the Pier 70 RMP; and Mitigation Measure M-HZ-4, p. 4.P.63, requiring implementation of the construction-related measures of the Hoedown Yard SMP. Implementation of these mitigation measures would ensure that the public, students and staff at nearby schools, and site occupants are not exposed to contaminated materials during construction, and the project's contribution to this cumulative impact would not be cumulatively considerable. Further, other projects in the *Pier 70 Preferred*

Master Plan area such as the 20th Street Historic Core Project and Crane Cove Park would be required to implement the requirements of the Pier 70 RMP. Projects outside of the *Pier 70 Preferred Master Plan* area would similarly be required to address site risks in accordance with Article 22A of the San Francisco Health Code, Article 22B of the San Francisco Health Code, and the Asbestos Air Toxics Control Measure. Implementation of these requirements would ensure that risks are within acceptable levels at these potentially cumulative sites. Implementation of these same measures would ensure that the project would not have a substantial contribution to impacts on schools within one-quarter mile of a school (Impact HZ-9).

Similarly, the Proposed Project could expose site occupants, workers, recreational users, and visitors to chemicals in the soil during operation, once the project is constructed. Because other cumulative projects also could be constructed on contaminated properties, including other areas within the *Pier 70 Preferred Master Plan* area, greater numbers of people could be exposed to chemicals in soil and this would potentially be a significant cumulative impact. However, in accordance with the Pier 70 RMP, the project sponsors would install a durable cover over the contamination within the *Pier 70 Preferred Master Plan* area and would implement Mitigation Measure M-HZ-3a for any maintenance activities that would disturb the durable cover. The project sponsors would also implement Mitigation Measure M-HZ-5, p. 4.P.65, requiring that development on proposed Parcels H1, H2, E3 is delayed until remediation of the PG&E Responsibility Area is complete, and Mitigation Measure M-HZ-6, pp. 4.P.67-4.P.68, requiring additional risk evaluations and vapor control measures for residential projects where soil vapor chemical concentrations exceed residential cleanup levels. The project sponsors would implement Mitigation Measure M-HZ-7, p. 4.P.69, requiring modification of the Hoedown Yard SMP to address risks associated with future uses of the Hoedown Yard. Implementation of these mitigation measures would ensure that the public and site occupants are not exposed to contaminated materials during operation, and the contribution of the Proposed Project to this cumulative impact would not be cumulatively considerable. Further, other projects in the *Pier 70 Preferred Master Plan* area such as the Orton Historic Core Sub Area and Crane Cove Park would be required to implement the requirements of the Pier 70 RMP. Projects outside of the *Pier 70 Preferred Master Plan* area would similarly be required to address site risks in accordance with Article 22A of the San Francisco Health Code. Implementation of these requirements would ensure that risks are within acceptable levels at these potentially cumulative sites.

None of the potentially cumulative projects would involve construction on, or use of, the Irish Hill remnant; therefore, there would be no cumulative impact related to exposure of site visitors to naturally occurring asbestos and metals associated with the Irish Hill remnant.

With implementation of the City's Emergency Response Plan, which provides a framework for Citywide emergency planning, and compliance with the San Francisco and Port of San Francisco's building code by all projects, cumulative impacts related to increased fire risks and interference with or impedance of an emergency response plan would be less than significant.

Q. MINERAL AND ENERGY RESOURCES

Section 4.Q, Mineral and Energy Resources, analyzes the effects of the Proposed Project related to mineral and energy resources. The Environmental Setting discussion describes existing conditions at the project site in regard to mineral and energy resources. The impacts analysis identifies impacts related to minerals and energy resources associated with development of the Proposed Project and discusses the changes in demand for energy that would occur with implementation of the Proposed Project. Cumulative effects of the Proposed Project in combination with past, present, and reasonably foreseeable future projects are also discussed.

Two additional sections in Chapter 4, Environmental Setting and Impacts, address related issues. The relationship between energy consumption and greenhouse gas emissions is discussed in Section 4.H, Greenhouse Gases. Water demand and water supply is discussed in Section 4.K, Utilities and Service Systems.

Data used in this section include information obtained from the Port of San Francisco (Port), the California Energy Commission (CEC), and other government agencies.

ENVIRONMENTAL SETTING

MINERAL RESOURCES

In accordance with the Surface Mining and Reclamation Act of 1975, the California Department of Conservation, Division of Mines and Geology (CDMG) has mapped non-fuel mineral resources of the State to show where economically significant mineral deposits are either present or likely to occur, based on the best available scientific data. These resources have been mapped using the California Mineral Land Classification System, which uses the following four Mineral Resource Zones (MRZs):

- MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence;
- MRZ-2: Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence;
- MRZ-3: Areas containing mineral deposits, the significance of which cannot be evaluated; and
- MRZ-4: Areas where available information is inadequate for assignment to any other zone.

All land in the City and County of San Francisco, including the project site, is designated MRZ-4.[1] Thus, the site is not a designated area of significant mineral deposits. There are no mining activities on the project site, and no mining activities are known to have occurred there.

ENERGY

As described in "Existing Project Site" in Section 4.B, Land Use, pp. 4.B.1-4.B.7, much of the project site is vacant or unused. Existing active land uses that do use energy either in the form of electricity and/or natural gas include Building 2 (warehouse/storage), Building 11 (the Noonan Building) (offices), the Building 12 complex (special events), Building 117 (storage),[2] a taxicab storage parking area, and the self-storage facility on the eastern part of the 28-Acre Site near San Francisco Bay. The 20th/Illinois Parcel is a surface parking lot that allows for outdoor retail activities, including special events. The Hoedown Yard is used by Pacific Gas & Electricity Company (PG&E) for dirt storage and maintenance activities.

Existing Electrical Demand

Energy demand is measured by power flow, expressed in kilowatt-hours (kWh) on a residential utility bill and in megawatt-hours (i.e., million Watt hours [MWh]) when describing large-scale uses, such as a city. Peak demand in California occurs on hot summer days when the cooling load is greatest; however, in the cool San Francisco Bay climate, peak demand may occur on a cold winter evening when the heating load is greatest (where electric heat is used). Peak demand is measured in capacity, expressed in megawatts (MW).

According to the CEC, California's per capita electricity use is the lowest of any state.[3] In 2010, the per capita usage was about 6,700 kWh per year for Californians.

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1 California Division of Mines and Geology, Open File Report 96-03, 1996 (available at ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/OFR_96-03/OFR_96-03_Text.pdf, accessed November 30, 2015), and Special Report 146 Parts I and II, 1986.

2 While Building 117 is located within the project site boundary, the Port has decided to demolish this building prior to approval of the Proposed Project. San Francisco Planning Department, Notification of Project Receiving Environmental Review, Illinois and 20th Streets/Pier 70 ("20th Street Historic Core"), Case No. 2016-000346ENV, September 8, 2016.

3 California Energy Commission (CEC) web site, "U.S. Per Capita Electricity Use by State in 2010." Available at http://energyalmanac.ca.gov/electricity/us_per_capita_electricity-2010.html. Accessed November 11, 2015.

Existing per capita electricity use in the zip code containing Pier 70 and its vicinity was estimated as 1,778 to 2,112 kWh/year in 2010.[4] For comparison, the range of per capita electricity use in San Francisco in 2010 was 1,302 to 3,740 kWh/year.

The existing electric energy demand at the project site is approximately 344 MWh per year.[5] The estimated average monthly electrical usage is 29 MWh per month. The estimated existing peak electrical-capacity demand (MW or kW) for the project site is not available.

Existing Electrical Supply

According to CEC data, 68 percent of California's electricity supply is generated in-State, while about 12 percent comes from the Northwest and 20 percent from the Southwest.[6] In 2014, the primary resources used to generate California's electricity were approximately 45 percent natural gas, 20 percent renewables (wind, solar, etc.), 9 percent nuclear, 6 percent coal, 5 percent large hydroelectric, and 15 percent from unspecified sources.[7]

San Francisco receives most (over 75 percent) of its electricity from PG&E. PG&E and SFPUC Power supply electricity to the project site and its other customers in San Francisco from a variety of renewable and non-renewable sources both within and outside of the State. In 2015, PG&E's resource mix was approximately 25 percent natural gas, 23 percent nuclear, 6 percent large hydroelectric, 30 percent renewables, and 17 percent unspecified sources.[8] PG&E's renewable electricity procurement was 23.8 percent of its retail sales for 2013 and is anticipated to be 31.3 percent by 2020.[9]

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4 Sustainable Communities, "Residential Per Capita Electricity Use (2010)" (web page), available at http://www.sustainablecommunitiesindex.org/img/indicators/pdf/Residential_Electricity_Use.pdf. Accessed November 19, 2015. Per capita electricity use for zip code 94107, which includes the project site. Source data from PG&E and complied by the City and County of San Francisco, Department of Public Health, Environmental Health Section. Note: Per capita energy data are often dependent upon U.S. Census data (census taken each decade and intermittent, e.g., a 5-year census update estimates).

5 Port of San Francisco, "Pier 70 Master Meter # 57718R," estimated based on October 2013 through October 2014 electrical consumption.

6 CEC, Energy Almanac, Energy Almanac, "Total Electricity System Power." Available at http://energyalmanac.ca.gov/electricity/total_system_power.html. Accessed March 11, 2016.

7 Ibid.

8 Pacific Gas & Electric Co., "Delivering Low-Emission Energy" (web page). Available at https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page. Accessed October 20, 2016.

9 CPUC, "California Renewables Portfolio Standard (RPS)" (web page). Available at http://www.cpuc.ca.gov/PUC/energy/Renewables/. Accessed November 30, 2015.

San Francisco uses about 6,000 gigawatt-hours of electricity per year,[10] and this use is expected to grow at a rate of 1.3 percent per year to about 8,000 gigawatt-hours by 2030. According to the San Francisco Public Utilities Commission's (SFPUC's) *Updated Electricity Resource Plan*, more than 50 percent of this demand is used for commercial purposes; residential use accounts for 23 percent.[11] PG&E also supplies natural gas to San Francisco from sources in the western United States.

Existing Natural Gas Demand

Natural gas is measured in cubic feet of gas or by its heat content in British Thermal Units (Btu), or therms.[12] According to the CEC, California's per capita natural gas use was 196 million Btu in 2014.[13] According to the CEC, California's total natural gas consumption in 2012 for industrial, residential, commercial, and electric power generation was 2,313 billion cubic feet per year (Bcf/year), up from 2,196 Bcf/year in 2010.[14] PG&E provides natural gas to San Francisco.

There are limited available data on natural gas consumption at the project site. The existing natural gas demand is approximately 1,674 million BTU (MMBtu) per year (which may be for only the Noonan Building).[15]

Existing Natural Gas Supply

According to the CEC, California's total natural gas demand in 2012 for industrial, residential, commercial, and electric power generation was 2,313 Bcf/year, up from 2,196 Bcf/year in 2010.[16] PG&E provides natural gas to San Francisco.

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[10] San Francisco Public Utilities Commission (SFPUC), *San Francisco's Updated Electricity Resource Plan*, March 2011 (hereinafter referred to as "*Updated Electricity Resource Plan*"), p. 38. Available online at http://sfwater.org/Modules/ShowDocument.aspx?documentID=40. Accessed November 13, 2015.

[11] SFPUC, *Updated Electricity Resource Plan*, p. 38.

[12] A British Thermal Unit is the amount of heat needed to raise the temperature of 1 pound of water (approximately 8.3 gallons) 1 degree Fahrenheit. A therm is a unit of measurement for natural gas, equivalent to 100,000 Btu's.

[13] U.S. Energy Information Administration, "State Profiles and Energy Estimates, Rankings: Total Energy Consumed per Capita, 2014." Available online at https://www.eia.gov/state/rankings/. Accessed August 9, 2016.

[14] CEC, "Supply and Demand of Natural Gas in California." Available online at http://energyalmanac.ca.gov/naturalgas/overview.html. Accessed November 14, 2015.

[15] Port of San Francisco, "Pier 70 Area, Utilities Usage Based on Available Information," based on 2013 natural gas consumption.

[16] CEC, "Supply and Demand of Natural Gas in California." Available online at http://energyalmanac.ca.gov/naturalgas/overview.html. Accessed November 14, 2015.

Because of its low density, natural gas is difficult to store.[17] After extraction from the earth, natural gas is transported over long distances by pipeline from sources to demand centers. Only a relatively small portion is stored in facilities or underground. Gas is typically supplied on-demand, and California's reliance on imported natural gas leaves the State vulnerable to price shocks and supply disruptions.

However, natural gas supplies nationwide have increased dramatically in the last several years, due to the technology of hydraulic fracturing (fracking) combined with new techniques for horizontal drilling into gas pockets underground. The natural gas market has experienced sustained low prices, which are expected to continue for the foreseeable future.

Existing Electricity and Natural Gas Infrastructure

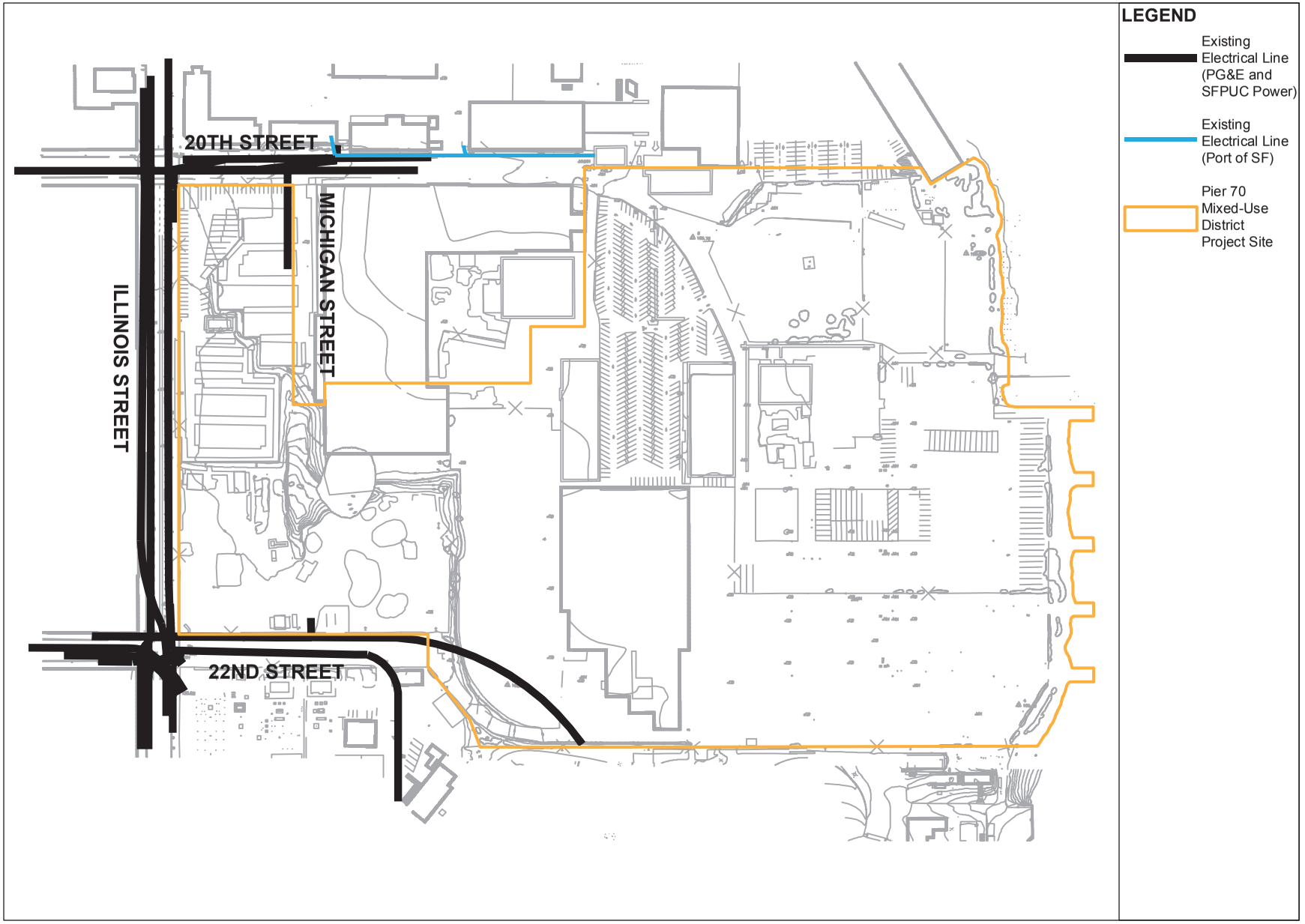
As described in "Electricity and Natural Gas" in Chapter 2, Project Description, p. 2.20, electricity is provided to the project site by PG&E and SFPUC Power through three 12-kilovolt (kV) electrical distribution circuits (generally, from 22nd Street, the Potrero Substation, and 20th Street). Two north-south, overhead 12-kV electrical distribution lines traverse Illinois Street and connect to the Potrero Substation located on the eastern side of Illinois Street between 22nd and 23rd streets. (See Figure 4.Q.1: Existing Electrical Infrastructure Serving the Project Site.) The existing 12-kV feeds to the project site (mentioned above or connecting with the above circuits) are underground along 22nd Street (owned by the Port), underground along 20th Street (owned by the Port once inside Building 102), and overhead along Michigan Street.

Natural gas is delivered to the project site through a PG&E-owned east-west natural gas line that runs under 20th and Michigan streets. The Port owns natural gas lines that connect to the PG&E line on 20th Street. From there, several smaller Port-owned natural gas distribution lines circulate natural gas throughout the 28-Acre Site. There are no existing natural gas lines connecting to the Illinois Parcels. (See Figure 4.Q.2: Existing Natural Gas Infrastructure Serving the Project Site.)

REGULATORY FRAMEWORK

The Federal, State, and local laws, regulations, and policies that govern and influence supply and demand for energy are described below. (See also Regulatory Framework in Section 4.H, Greenhouse Gas Emissions, pp. 4.H.3-4.H.8, which addresses Federal, State, and local rules and policies intended to decrease emissions of greenhouse gases. Many of those regulations are intended to reduce energy use and to encourage switching from fossil fuels to renewable sources.)

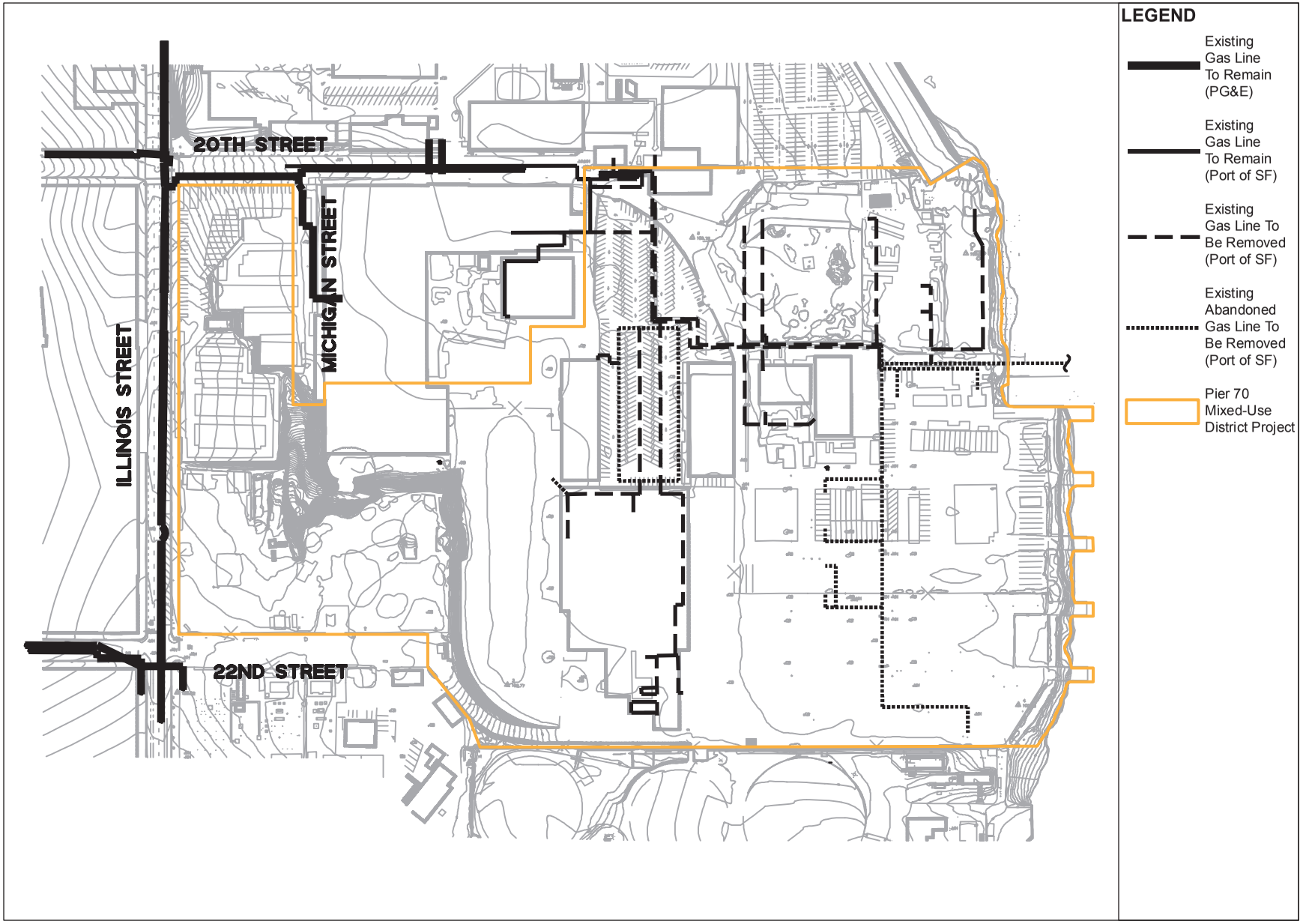
[17] Liquefying natural gas by greatly reducing its temperature reduces the storage volume needed, but this process is expensive.



Source: BKF (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.Q.1: EXISTING ELECTRICAL INFRASTRUCTURE SERVING THE PROJECT SITE



Source: BKF (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 4.Q.2: EXISTING NATURAL GAS INFRASTRUCTURE SERVING THE PROJECT SITE

FEDERAL

The Energy Independence and Security Act of 2007 was a major, comprehensive energy package at the Federal level. It includes a renewable fuel standard (Section 202), appliance and lighting efficiency standards (Sections 301-325), and building energy efficiency standards (Sections 411-441).

The American Recovery and Reinvestment Act of 2009 (H.R. 1, also known as the "Stimulus Bill") included a number of provisions to encourage the development and financing of renewable energy, from demonstration project funding to loan guarantees.

STATE

Energy Efficiency

California Code of Regulations Title 24

The California Code of Regulations, Title 24, parts 1 and 6 (referred to below as "Title 24") regulates energy efficiency and water efficiency in buildings. Title 24 provides construction standards for heating, cooling, ventilation, water heating, and certain types of lighting.[18] The CEC also regulates appliance efficiency and has adopted progressively more stringent regulations over the years.[19]

The California Green Building Standards Code establishes standards including planning and design for sustainable site development, energy efficiency in excess of the California Energy Code requirements, and other matters. This code allows local jurisdictions that had already adopted green building standards to retain them if they are as, or more, stringent than the provisions in the State code.

The California Public Utilities Commission (CPUC) regulates investor-owned utilities operating in California, including PG&E. The CPUC has required utilities to conduct energy efficiency (or "demand-side management") programs for many years, including, for example, subsidies for installing weatherization (e.g., insulation, weather stripping, hot water heater insulation blankets) in residential buildings.

[18] These regulations are available at CEC, "Building Energy Efficiency Program" (web page). Available at http://www.energy.ca.gov/title24/. Accessed November 13, 2015.

[19] CEC, "Appliance Efficiency Program" (web page). Available at http://www.energy.ca.gov/appliances/. Accessed November 13, 2015. http://www.energy.ca.gov/appliances/index.html.

Energy Supply

Renewable Portfolio Standard and Senate Bill 350

The Renewable Portfolio Standard (RPS) requires retail sellers of electricity to provide a percentage of their electricity supply from renewable sources by certain years.[20] (See Regulatory Framework in Section 4.H, Greenhouse Gas Emissions, pp. 4.H.6-4.H.7, for background information on the RPS.) Eligible renewable sources include geothermal, ocean wave, solar photovoltaic (PV), and wind, but exclude large hydroelectric (30 MW or more). Senate Bill 350 (Chapter 547, Statutes of 2015), signed by Governor Brown in October 2015, dramatically increased the stringency of the RPS. Senate Bill 350 establishes an RPS target of 50 percent by 2030, along with interim targets of 40 percent by 2024 and 45 percent by 2027. The CEC and CPUC also have extensive programs to implement the RPS and otherwise encourage renewable energy.

LOCAL REGULATIONS AND PLANS

San Francisco General Plan

The Environmental Protection Element[21] of the *San Francisco General Plan* contains a section on energy. The following objectives and policies are relevant to the Proposed Project:

Objective 12 Establish the City and County of San Francisco as a Model for Energy Management.

- Policy 12.1 Incorporate energy management practices into building, facility, and fleet maintenance and operations.
- Policy 12.3 Investigate and implement techniques to reduce municipal energy requirements.
- Policy 12.4 Encourage investment in capital projects that will increase municipal energy production in an environmentally responsible manner.
- Policy 12.5 Include energy emergency preparedness plans in municipal operations.

Objective 13 Enhance the Energy Efficiency of Housing in San Francisco.

- Policy 13.2 Strengthen enforcement of the state's residential energy conservation building standards.
- Policy 13.3 Expand the environmental review process to encourage the use of additional measures to save energy in new housing.
- Policy 13.4 Encourage the use of energy conserving appliances and lighting systems.

[20] California Public Utilities Commission, RPS Program Overview, June 2015. Available online at http://www.cpuc.ca.gov/PUC/energy/Renewables/overview.htm. Accessed November 2, 2015.

[21] The Environmental Protection Element, http://www.sf-planning.org/ftp/general_plan/I6_Environmental_Protection.htm#ENV_EGY. Accessed November 13, 2015.

Objective 14 Promote Effective Energy Management Practices to Maintain the Economic Vitality of Commerce and Industry.

Policy 14.2 Insure adequate local enforcement of California's non-residential building standards.

Policy 14.3 Commercial case studies and energy research efforts should be undertaken to determine cost-effective energy conservation strategies, e.g. single metering, integrated energy systems, flextime to reduce peak transit use, that should be integrated into EIR procedures.

Policy 14.4 Promote commercial office building design appropriate for local climate conditions.

Policy 14.5 Encourage use of integrated energy systems.

Objective 15 Increase the Energy Efficiency of Transportation and Encourage Land Use Patterns and Methods of Transportation Which Use Less Energy.

Policy 15.1 Increase the use of transportation alternatives to the automobile.

Policy 15.3 Encourage an urban design pattern that will minimize travel requirements among working, shopping, recreation, school and childcare areas.

Policy 15.5 Encourage consideration of energy use issues when making transportation investment decisions.

Objective 16 Promote the Use of Renewable Energy Sources.

Policy 16.1 Develop land use policies that will encourage the use of renewable energy sources.

San Francisco Green Building Requirements

San Francisco's Green Building Requirements place obligations for energy and water efficiency on the Proposed Project (water efficiency saves energy by reducing the energy needed for collection, conveyance, treatment, and distribution of water). All new buildings and additions to existing buildings under the Proposed Project (including those on Port property) would comply with the San Francisco Green Building Ordinance requirements of the San Francisco Green Building Code. Buildings must comply with Title 24 Part 6 (2013) Energy Standards, and additionally meet energy efficiency prerequisites of the applicable green building rating system (GreenPoint Rated, LEED for Homes or LEED BD+C 2009). New non-residential buildings must conduct design and construction commissioning to verify that energy- and water-using components meet the owner's or owner representative's project requirements. San Francisco requires new large commercial projects, new high-rise residential projects, and commercial interior projects to provide designated parking for low-emitting, fuel-efficient, and carpool/van pool vehicles.

The Green Building Code was amended in April 2016 to establish requirements for certain new building construction to include development of renewable energy facilities (Sections 4.201.2 and 5.201.1.2 of the Green Building Code). The requirements include the installation of solar PV systems and/or solar thermal systems in the solar zone (i.e., an allocated space that is unshaded and free of obstructions, usually a roof). The renewable energy requirements are applicable to residential and non-residential new construction projects of 10 occupied floors or less.

San Francisco Electricity Resource Plan

In December 2002, the City adopted the *Electricity Resource Plan*, which includes implementation steps for the following strategies: maximize energy efficiency; develop renewable power; ensure reliable power; support affordable electric bills; improve air quality and prevent other environmental impacts; support environmental justice; promote opportunities for economic development; and increase local control over energy resources. The *Electricity Resource Plan* is a broad policy guide that provides a framework for more specific Citywide future programs and actions. In response to the Board of Supervisors' guidance in their 2009 Ordinance 94-09, SFPUC staff have developed an updated *Electricity Resource Plan*.[22] This update identifies proposed recommendations to work towards achieving the broad policy goals laid out in the 2002 Plan.

The City also has a number of programs to further promote energy conservation among residents and businesses. The San Francisco Energy Watch Program offers free consultation about energy-efficient appliances and installation at a reduced fee, as well as information about rebates, audits, and incentives, to businesses and multi-family property owners. Typical equipment improvements include lighting, domestic hot water heating, heating ventilation and air conditioning units, and washers and dryers.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on mineral and energy resources. Implementation of the Proposed Project would have a significant effect on mineral and energy resources if the project would:

[22] San Francisco Public Utilities Commission, "San Francisco's Electricity Resource Plan," (web page). Available at http://sfwater.org/index.aspx?page=700. Accessed November 13, 2015.

Q.1 Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state;

Q.2 Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan; or

Q.3 Encourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner.

APPROACH TO ANALYSIS

A number of factors may be considered in determining whether a project would use a large amount of energy or whether the use of energy would be wasteful. They include (1) the degree to which energy conservation measures would be applied, (2) use of on-site renewable energy, and (3) conformance with policies geared to energy efficiency.[23]

Most of the Proposed Project's electrical and natural gas demand was estimated using the CalEEMod model, as further described below under "Energy Demand," pp. 4.Q.14-4.Q.17. This model was also used in the air quality analysis presented in Section 4.G, Air Quality. Transportation fuel use demand estimates were developed using projected vehicle miles traveled and fuel-efficiency data.

Because the same features and performance standards would apply to the Maximum Residential Scenario, the Maximum Commercial Scenario, and an actual build-out that may lie somewhere between these scenarios, the impact analysis does not need to differentiate between the scenarios, except where forecasted usage is quantified. Similarly, there are no relevant location-specific aspects to meeting energy and water efficiency requirements; therefore, the impact analysis does not need to differentiate between the 28-Acre Parcel and the Illinois Parcels. Nevertheless, quantified forecasted energy estimates have been made distinguishing the 28-Acre Parcel and the Illinois Parcels.

PROJECT FEATURES

The Proposed Project would be a high-density, mixed-use infill development in a transit-oriented district. It would comply with the San Francisco Green Building Requirements related to energy efficiency. The project sponsors or developers of future buildings on the project site shall provide documentation demonstrating that the Title 24 Part 6 (2013) Energy Standards would be met, including the compliance margin required for the certification system chosen by the project sponsors (GreenPoint Rated or Leadership in Energy and Environmental Design [LEED®]

[23] State CEQA Guidelines, Appendix F, "Energy Conservation," provides a list of optional factors that an EIR may consider in analyzing the energy implications of a project.

Gold).[24] The Proposed Project's new buildings would comply with energy efficiency requirements of the San Francisco Green Building Code, and energy-efficient appliances and energy-efficient lighting would be installed in the three rehabilitated historic buildings. Buildings would be heated and cooled individually, independent from the adjacent buildings.

As described in "Renewable Energy" in Chapter 2, Project Description, p. 2.67, the Proposed Project is required to meet the State's Title 24 and the San Francisco Green Building Requirements for renewable energy.[25] Title 24 requires that 15 percent of roof area is to be built as "solar ready", and the San Francisco Green Building Code further requires that Solar PV systems and/or solar thermal systems be installed. The Proposed Project would include roof-mounted or building-integrated solar PV systems and/or roof-mounted solar thermal hot water systems for all proposed buildings, excluding existing Buildings 2, 12, and 21. The Proposed Project may interconnect these PV systems via a community microgrid that serves as a site-wide distribution network capable of balancing captive supply and demand resources to maintain stable service within the project site.

To reduce potable water demand, high-efficiency fixtures and appliances would be installed in new buildings, and fixtures in existing buildings would be retrofitted, as required by City regulations. Reductions in water use save energy that would otherwise be used to transport and treat the water. (See Table 4.H.2: Regulations Applicable to Private Development Projects, in Section 4.H, Greenhouse Gases, pp. 4.H.13-4.H.28, for additional requirements regarding energy and water conservation and sustainability standards and practices to which the Proposed Project must adhere.)

As described in "Proposed Infrastructure and Utilities," pp. 2.66-2.67, the Proposed Project would replace overhead electrical distribution with a joint trench distribution system that would follow the roadways. The existing natural gas distribution system would be extended to cover the entire project site, and the piping would be realigned within the proposed roadway network to serve the project site. The new electrical distribution lines would connect to the existing 12-kV electricity lines. The new gas distribution lines would connect to existing gas mains.

Back-up emergency diesel generators are required by the San Francisco Building Code for buildings with occupied floor levels greater than 75 feet in height. There are 10 parcels (all in the 28-Acre Site) that would allow building heights of up to 90 feet: Parcels A, B, C1, C2, D, E1, F, G, H1, and H2. The new buildings on these parcels with occupied floor levels greater than

[24] A compliance margin is a percentage (such as 10 or 25 percent) that a builder must achieve in energy savings over the applicable energy efficiency building standard.
[25] San Francisco Building Code, Chapter 13C.

75 feet (up to 11 new buildings) would each have a back-up diesel generator with an average size of 400 horsepower (11 generators total).

The anticipated new 20th Street pump station northeast of the project site, adjacent to Building 6 on the BAE Systems Ship Repair site, would augment the Proposed Project's wastewater and stormwater infrastructure. The new pump station would use electricity.

The Proposed Project would include transportation-related features that would reduce vehicle use such as bike paths, Class I and Class II bicycle parking spaces, and car share parking spaces.

Chapter 6, Variants, discusses the District Energy System Variant, a possible variant under consideration that would reduce energy use (see pp. 6.31-6.45). Two other variants, the Automated Waste Collection System and Reduced Off-Haul Variants (see pp. 6.69-6.86 and pp. 6.1-6.31, respectively), would reduce transportation-related fuel use. The Wastewater Treatment and Reuse System Variant (pp. 6.45-6.69) would use water-saving technology to reduce demand on energy-intensive systems that would deliver and treat water.

IMPACT EVALUATION

Impact ME-1: The Proposed Project would not have a significant adverse impact on the availability of a known mineral resource and/or a locally important mineral resource recovery site. ***(No Impact)***

The project site has historically been developed and is located in an urbanized area of San Francisco. CDMG has designated the project site as MRZ-4 (areas where available information is inadequate for assignment to any other zone). In addition, there are no known mineral resources on the project site or in the vicinity. Therefore, implementation of the Proposed Project would not impact any known mineral resources on the project site. Additionally, there are no designated mineral resource recovery sites in the project vicinity whose operations or accessibility would be affected by the construction or operation of the Proposed Project. Therefore, the Proposed Project would have no impact on known mineral resources or any locally important mineral resource recovery site. No mitigation measures are necessary.

Impact ME-2: The Proposed Project would not have a substantial adverse effect on the use of fuel, water, or energy consumption, and would not encourage activities that could result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner. ***(Less than Significant)***

<u>Energy Demand</u>

Table 4.Q.1: Estimated Electrical and Natural Gas Demand at Full Build-out for the Maximum Residential Scenario and the Maximum Commercial Scenario, Excluding Solar Photovoltaic and

Solar Thermal, provides a conservative estimate of building-related electricity and natural gas demand for the Proposed Project at full-build out under each scenario, not taking into account energy savings provided by any solar PV or solar thermal systems.

Table 4.Q.1: Estimated Electrical and Natural Gas Demand at Full Build-out for the Maximum Residential Scenario and the Maximum Commercial Scenario, Excluding Solar Photovoltaic and Solar Thermal

Scenario/Area	Estimated Electrical Demand (MWh/year) (excludes solar photovoltaic)	Estimated Natural Gas Demand (MMBtu/year) (excludes solar thermal)
Maximum Residential Scenario		
28-Acre Site	32,772	89,159
Illinois Parcels	4,054	17,399
Total	**36, 826**	**106,558**
Maximum Commercial Scenario		
28-Acre Site	41,691	81,191
Illinois Parcels	5,719	15,100
Total	**47,410**	**96, 291**

*Note*s: CalEEMod estimates electricity and natural gas usage based on building square footage by type of use. The CalEEMod model is also used in the air quality impact analysis, and is discussed in Section 4.G, Air Quality.

MWh = megawatt-hours = 1000 x kWh. A typical residential electric bill is expressed in kilowatt-hours.

MMBtu = million Btu. A typical residential natural gas bill is expressed in therms. 1 therm = 100,000 Btu = 0.1 MMBtu.

Source: ESA, CalEEMod model run

The existing electric energy demand at the project site is approximately 344 MWh per year. Thus, under either the Maximum Residential Scenario or the Maximum Commercial Scenario, electricity use would substantially increase under the Proposed Project at build-out.

Based on the limited available data, the existing natural gas demand is approximately 1,674 MMBtu per year (which may be for only the Noonan Building [Building 11]). Thus, under either the Maximum Residential Scenario or the Maximum Commercial Scenario, natural gas consumption would greatly increase under the Proposed Project at build-out.

For both electricity and natural gas, compared to the mix of other existing development in San Francisco and the region, compliance with the latest Title 24 and other requirements would ensure that the Proposed Project would be more efficient than all but recent buildings built to the same requirements, or buildings for which owners decided to exceed efficiency requirements.

The Proposed Project would be required to meet current State and local codes and ordinances concerning energy consumption, including Title 24 and the applicable regulations listed in the San Francisco GHG Checklist; electricity and natural gas usage would therefore not be wasteful. The Proposed Project would include compliance with Sections 4.201.2 and 5.201.1.2 of the San Francisco Green Building Code, as applicable, for solar PV and solar thermal energy development on or near the proposed buildings.[26] Generally, these standards are among the strictest in the nation, if not the strictest. Documentation showing Title 24 standards compliance must be submitted by the developer to the San Francisco Department of Building Inspection with the application for building permit. Therefore, the Proposed Project would be required to comply with the energy conservation measures and would be in conformance with policies geared to energy efficiency. (See Chapter 6, Variants, pp. 6.31-6.45, for a discussion of the District Energy System Variant.)

One such assertive energy ordinance was adopted into the San Francisco Green Building Code in April 2016 which builds upon existing Title 24 regulations by requiring that all new buildings with 10 floors or fewer must have either solar PV or solar thermal panels installed. In compliance with Title 24 and the San Francisco Green Building Code, the Proposed Project would dedicate at least 15 percent of available roof area to solar PV and/or solar thermal hot water systems for residential and commercial buildings. The total unshaded roof area of the Proposed Project is estimated to be approximately 600,000 sq. ft.[27] The installation of PV on 15 percent of available roof area would cover approximately 90,000 sq. ft. with approximately 1.4 MW of solar PV panel arrays. With an estimated output of 1,540 kWh/kWp, 1.4 MW of solar PV panel arrays could produce up to approximately 2,150 MWH of renewable electricity per year and offset about 5.8 percent of the Proposed Project's total energy consumption under the Maximum Residential Scenario and 4.5 percent under the Maximum Residential Scenario. By comparison, the maximum possible usage of rooftop area for solar PV is an estimated 6.5 MW of solar PV panel arrays, which could produce up to approximately 10,000 MWh of renewable electricity per year and offset about one-fourth of the electricity demand of the Maximum Residential Scenario and about one-fifth of the electricity demand of the Maximum Commercial Scenario.[28][29]

[26] The Better Roof Ordinance's solar PV and solar thermal energy requirements only apply to buildings that are 10 occupied stories or less.

[27] See Memorandum to Kelly Pretzer, Forest City, from Melissa Higbee, AECOM, re: Assumptions for Pier 70 Energy Calculations, November 25, 2015, pp. 5-7.

[28] Ibid.

[29] This analysis assumes that 70 percent of available unshaded roof area would be devoted to PV due to maintenance and other rooftop space requirements.

The contribution of solar thermal is limited by the domestic hot water demand of the Proposed Project[30]. As a hypothetical example, under the Maximum Residential Scenario, 45,000 sq. ft. of solar thermal could offset the equivalent of 1.3 percent of the Proposed Project's total energy consumption.[31] Under the Maximum Commercial Scenario, 30,000 sq. ft. of roof-mounted solar thermal hot water systems could offset the equivalent of 0.8 percent of energy consumption.

The anticipated new 20th Street pump station northeast of the project site would use electricity. The new pump station would have larger wastewater flow capacity than the existing pump station, which was installed in 1993. The flow capacity has yet to be determined; therefore, the expected electricity usage required is not available. However, even if wastewater flow would be larger, present-day electric motors are more efficient than the existing 1993 equipment. For example, substantial advances have been made in using electronic pump controls for variable pumping speed, which reduces electricity use.[32] Therefore, there may or may not be an increase in electricity demand corresponding to the increase in pump station flow capacity.

For these reasons, the Proposed Project would have a less-than-significant impact on the use of energy and would not result in the use of large amounts, or in the wasteful use, of energy. No mitigation measures are necessary.

Water Demand

Section 4.K, Utilities and Service Systems, describes the water supply and demand aspects of the Proposed Project. The Proposed Project would include required water conservation practices to reduce the amount of water used. Water-efficient plumbing fixtures would be installed throughout the new and renovated buildings. Landscaping and street trees would be water efficient. Therefore, the Proposed Project would include the application of required water conservation measures and would be in conformance with policies addressing water efficiency. For these reasons, the Proposed Project would have a less-than-significant impact on water use and would not result in the wasteful use of water. No mitigation measures are necessary regarding water use.

[30] Pier 70 Draft Sustainability Plan, January 2016, p. 61.

[31] See Memorandum to Kelly Pretzer, Forest City, from Melissa Higbee, AECOM, re: Assumptions for Pier 70 Energy Calculations, November 25, 2015, pp. 5-7.

[32] For example, a U.S. Department of Energy study states, "With rotodynamic pump installations, savings of between 30% and 50% have been achieved in many installations by installing VSDs [Variable Speed Drives]. U.S. Department of Energy, Energy Efficiency and Renewable Energy (office), Industrial Technologies Program, "Variable Speed Pumping: A Guide to Successful Applications: Executive Summary," p. 10. Available at https://www1.eere.energy.gov/manufacturing/tech_assistance/pdfs/variable_speed_pumping.pdf. Accessed December 16, 2015.

Compared to the mix of other existing development in San Francisco and the region, compliance with the latest Title 24 and other requirements would ensure that the Proposed Project would be more water efficient than all but recent buildings built to the same requirements, or buildings for which owners decided to exceed efficiency requirements.

Transportation Fuel Demand

Comparison of transportation fuel use and efficiency between the Proposed Project and the mix of other existing development in San Francisco or the region is speculative; however, relative to other households and employment uses in the City, the project site is better served by transit than outlying residential neighborhoods of the City, such as the Sunset District, but less well-served by transit than areas in or near Downtown.

Table 4.Q.2: Approximate Transportation Fuel Demand at Full Build-out for the Maximum Residential Scenario and the Maximum Commercial Scenario provides estimated transportation-related gasoline and diesel demand for the Proposed Project at full build-out under each scenario.[33]

As discussed in Section 4.E, Transportation and Circulation, under "Background Vehicle Miles Traveled in San Francisco and Bay Area," on pp. 4.E.9-4.E.10, San Francisco has a lower vehicle miles traveled (VMT) ratio than the Bay Area region as a whole. The transportation analysis zone in which the project site is located (TAZ 559) has between 24 and 49 percent fewer daily VMT than the Bay Area regional average. Furthermore, the following transportation-related aspects of the Proposed Project would discourage single-occupancy vehicle trips: proximity to transit, bicycle paths, bicycle storage, bike share shuttles, pedestrian walkways, and a Transportation Demand Management (TDM) Plan with strategies to discourage the use of automobiles and to encourage transit and other modes of transportation. Mitigation Measure M-AQ-1f: Transportation Demand Management, in Section 4.G, Air Quality, pp. 4.G.47-4.G.50, includes further measures that would reduce vehicle trips. Because the Proposed Project is an infill mixed-use development in a transit-rich area, the Proposed Project's vehicle trips and associated fuel use would not constitute wasteful use of energy and therefore would be is consistent with the Plan Bay Area land use strategy which seeks to reduce per capita VMT.[34]

[33] Diesel fuel would also be used for periodic testing and infrequent running of emergency generators. Testing is generally limited to 50 hours or less per year for each generator under BAAQMD air permits. It is difficult to forecast emergency use, as the events are typically rare.

[34] Plan Bay Area is a nine-county long-range plan to meet the requirements of California's 2008 Senate Bill 375 (SB 375), which call on each of the State's 18 metropolitan areas to develop a Sustainable Communities Strategy, an integrated transportation, land use, and housing plan that addresses ways to accommodate future population growth and reduce greenhouse gas emissions.

Table 4.Q.2: Approximate Transportation Fuel Demand at Full Build-out for the Maximum Residential Scenario and the Maximum Commercial Scenario

Scenario/Area	Estimated Gasoline Demand (1000's gallons / year)	Estimated Diesel Demand (1000's gallons / year)
Maximum Residential Scenario		
28-Acre Site	2,161	315
Illinois Parcels	242	35
Total[1]	**2,403**	**350**
Maximum Commercial Scenario		
28-Acre Site	2,346	342
Illinois Parcels	237	35
Total[1]	**2,584**	**376**

Notes: CalEEMod estimates vehicle miles traveled (VMT) based on building square footage by type of use. Vehicle fuel efficiency figures (gasoline, electric hybrid, electric only, and diesel) are rough approximations based on the EMFAC2014 model run. Assumptions used herein are 31.5 mpg for gasoline-powered vehicles (light-duty) and hybrid-electric, which are an estimated 88.9% of the Pier 70-related trips per CalEEMod; 0 mpg for fully-electric vehicles, which are an estimated 6.4% of the Pier 70-related trips per CalEEMod; and 17.2 mpg for diesel-powered vehicles (medium- and heavy-duty), which are an estimated 4.6% of the Pier 70-related trips per CalEEMod.

[1] Totals include rounding from underlying calculations.

Sources: (1) Vehicle Miles Traveled from ESA, CalEEMod model run (split is 88.9% gasoline and hybrid gasoline-electric, 6.4% electric-only, and 4.6% diesel); (2) Composite MPG from ESA, EMFAC2014 (v1.0.7) Emissions Inventory, San Francisco County, Calendar Year 2030 (annual), EMFAC2011 Vehicle Classification Categories

For these reasons, the Proposed Project would have a less-than-significant impact on the use of transportation fuel energy and would not result in the use of large amounts or in the wasteful use of energy. No mitigation measures are necessary regarding transportation-related fuel use.

Energy Demand and Supply

The CEC and local government siting authorities consider applications for the development of new power-generating facilities in San Francisco, the Bay Area, and elsewhere in the State on an ongoing basis. These facilities could supply additional energy to the power supply "grid" within the next few years. The CPUC uses an ongoing series of proceedings (Long Term Procurement Plan, Resource Adequacy, and RPS-related proceedings) to plan for an adequate long-term electricity supply with an increasing proportion of renewable electricity. The demand for electricity generated by the Proposed Project would be negligible in the context of overall demand within San Francisco and the State, and would not in and of itself require a major expansion of power facilities. Therefore, the energy demand associated with the Proposed Project would not result in a significant environmental effect. No mitigation measures are necessary.

Impact ME-3: The Proposed Project would not result in new or expansion of existing electric or natural gas transmission and/or distribution facilities that would cause significant physical environmental effects. ***(Less than Significant)***

As discussed in "Project Features" on pp. 4.Q.12-4.Q.13, the Proposed Project would replace overhead electrical distribution with a joint trench distribution system following the roadways. The existing natural gas distribution system would be extended within the project site to cover the entire project site, as realigned within the proposed roadway network. The new electrical distribution lines would connect to the existing 12-kV electricity distribution grid. The new gas distribution lines would connect to existing gas mains (i.e., a 4-inch gas main under 20th Street, and gas transmission lines under Illinois and 20th streets).

The existing utility-owned 12-kV electricity distribution grid and existing gas mains adjacent to the project boundaries are expected to have adequate capacity to serve the Proposed Project's demand. If the SFPUC would be the electricity provider, the Proposed Project would need wholesale distribution transformers to convert the power from PG&E to the SFPUC. These transformers could be located on poles, on the sidewalk, or in a building.

For these reasons, the Proposed Project would not cause significant physical environmental effects as a result of new or expansion of existing electric or natural gas transmission and/or distribution facilities, and this impact would be less than significant. No mitigation measures are necessary.

Cumulative Impacts

Impact C-ME-1: The Proposed Project, in combination with other past, present and reasonably foreseeable future projects in the vicinity, would not result in a cumulatively considerable contribution to a significant adverse cumulative impact on mineral and energy resources. ***(Less than Significant)***

There are no known mineral resources or resource recovery sites on the project site or in the vicinity. All land in the City and County of San Francisco, including the project site, is designated MRZ-4. Therefore, none of the projects identified as cumulative development have mineral resources or resource recovery sites. There would be no cumulative impact on minerals.

Reasonably foreseeable development projects listed in the "Approach to Cumulative Impact Analysis" of Section 4.A, Introduction to Chapter 4, pp. 4.A.12-4.A.17, involving newly constructed buildings or alterations to existing buildings would be subject to the energy and conservation standards required by CCR Title 24, San Francisco Building Code, and the numerous other requirements summarized in Section 4.H, Greenhouse Gases (see Table 4.H.2: Regulations Applicable to the Proposed Project, pp. 4.H.13-4.H.28) as applicable for each land use category (residential or non-residential). Because of the energy and water efficiency

requirements under CCR Title 24, San Francisco Building Code, and other regulations listed in Table 4.H.2, and the availability of transportation options, each of the reasonably foreseeable development projects would not use fuel, water, or energy in a wasteful manner.

In summary, the Proposed Project, combined with the reasonably foreseeable cumulative development projects in the vicinity, would not result in any cumulatively considerable contribution to a significant cumulative impact on mineral and energy resources, either directly or indirectly. No mitigation measures are necessary.

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R. AGRICULTURE AND FOREST RESOURCES

Section 4.R, Agriculture and Forest Resources, examines the effects of the Proposed Project related to agricultural and forest resources. The Environmental Setting discussion describes the existing baseline conditions for agriculture and forest resources. The Impacts and Mitigation Measures discussion addresses the potential effects on agriculture and forest resources that would result from implementation of the Proposed Project. Both project-level and cumulative environmental impacts are evaluated.

ENVIRONMENTAL SETTING

The project site is located within a developed and urbanized area of San Francisco. Much of the eastern and northern portions of the project site is reclaimed, artificially filled land that was once underwater. The western portion of the project site, which has been developed since the 1860s, is underlain by either fill or bedrock.[1] The majority of the project site, including all of the 28-Acre Site and most of the Illinois Parcels, is zoned M-2 (Heavy Industrial). The southern portion of the Illinois Parcels is zoned P (Public). The project site does not contain agricultural uses, nor is it zoned for such uses.

The California Department of Conservation's Farmland Mapping and Monitoring Program identifies the City and County of San Francisco as Urban and Built-Up Land, which is defined as:

> land [that] is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.[2]

The project site is not classified as having any farmland, nor is it zoned for agricultural use. There are no areas designated on or near the site as Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor are there areas under Williamson Act[3] contract. The project site has almost no vegetation, except for scattered ground-level shrubs and multi-trunk eucalyptus trees on the remnant of Irish Hill and scattered vegetation east of Building 19, near the radio antenna in the northeastern part of the site. None of these trees are native species or harvested for timber. Thus, the project site does not contain any forest land or timberland.

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1 ESA, Pier 70 Mixed-Use District Project, City and County of San Francisco, Archaeological Research Design and Treatment Plan, June 2015.

2 California Department of Conservation, San Francisco Bay Area Important Farmland 2010. Available online at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/regional/2010/bay_area_fmmp2010.pdf. Accessed August 21, 2015.

3 The Williamson Act is a California law enacted in 1965 that provides property tax relief to owners of farmland and open space land in exchange for a 10-year agreement that the land will not be developed or converted into another use.

REGULATORY FRAMEWORK

There are no Federal or State laws, regulations, plans, or policies related to agricultural and forest resources applicable to implementation of the Proposed Project.

LOCAL

San Francisco General Plan

The topic of agriculture is discussed in the following objective in the *San Francisco General Plan*'s Recreation and Open Space Element:

> Policy 1.8 Support urban agriculture and local food security through development of policies and programs that encourage food production throughout San Francisco.

Urban Agriculture Ordinance

The Urban Agriculture Ordinance established the Urban Agriculture Program in San Francisco. The Urban Agriculture Program coordinates the efforts of City agencies to promote, advocate, and coordinate urban agriculture activities in the City.

Urban Agriculture Incentive Zone Act Procedures Ordinance

The Urban Agriculture Incentive Zone Act Procedures Ordinance provides the ability for the City and a property owner to initiate a contract to keep property in an active agricultural use for a set period of time. The property owners may apply if their property:

- Is located within a zoning district where Neighborhood Agricultural or Large-Scale Urban Agricultural Uses are principally or conditionally permitted uses;
- Is at least 0.10 acres and not more than 3 acres in size;
- Does not include any dwelling units; and,
- Includes only structures that are accessory to the agricultural activity, including, but not limited to toolsheds, greenhouses, produce stands, and educational space.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the Proposed Project would result in a significant impact on agricultural and forest resources. Implementation of the

Proposed Project would have a significant effect on agricultural and forest resources if the project would:

R.1 Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;

R.2 Conflict with the existing zoning for agricultural use or a Williamson Act contract;

R.3 Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), or timberland (as defined by Public Resources Code Section 4526);

R.4 Result in the loss of forest land or conversion of forest land to non-forest use; or

R.5 Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland of Statewide Importance to non-agricultural use or conversion of forest land to non-forest use.

APPROACH TO ANALYSIS

This analysis evaluates the Proposed Project's potential effects related to agricultural and forest resources. California Department of Conservation maps and City and County of San Francisco zoning maps were reviewed to identify conflicts with agriculture and/or forest resources. Generally, less-than-significant impacts to agriculture and forest resources would occur if there are no conflicts with existing agricultural zoning, Williamson Act contracts, or designated farmland, timberland, or forest land.

Those features of the Pier 70 Mixed-Use District Project that could have an effect on agricultural and forest resources, particularly the location and area of ground disturbance and removal of vegetation within the project site as described below under "Project Features," are the same or substantially similar under the Maximum Commercial Scenario and the Maximum Residential Scenario, the three options for sewer/wastewater treatment, and the three options for grading around Building 12 that are analyzed in this EIR. To the extent that these features may differ somewhat from one to another, they are generally included and accounted for in an analysis of maximum ground disturbance within the project site. The same agriculture and forest resources regulatory requirements and mitigation measures, if any, applicable to the Proposed Project are equally applicable under the Proposed Project's scenarios and options. Therefore, this impact analysis of impacts on agricultural and forest resources applies to both scenarios and no separate analysis of impacts under each scenario or option is necessary.

PROJECT FEATURES

The Proposed Project entails the development of the 28-Acre Site and Illinois Parcels with residential, commercial-office, and retail/arts/light-industrial uses, among others. Under the

Proposed Project, if district parking structures are constructed on Parcels C1 and C2, their rooftops may be used as open space that could include urban agriculture plots.

IMPACT EVALUATION

Impact AG-1: The Proposed Project would not convert designated farmland under the Farmland Mapping and Monitoring Program, nor would it conflict with any existing agricultural zoning or a Williamson Act contract, nor would it involve any changes to the environment that would result in the conversion of designated farmland. (*No Impact*)

The California Department of Conservation, Division of Land Resource Protection, maps important farmland, including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. Agricultural land is rated according to soil quality and irrigation status; the best quality land is called Prime Farmland. The California Department of Conservation's Farmland Mapping and Monitoring Program identifies the City and County of San Francisco, including the project site, as "Urban and Built-up," and considers all of San Francisco to be outside of its agricultural survey area.[4]

Because the 28-Acre Site and the Illinois Parcels do not contain designated farmland, the Proposed Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use.

The Proposed Project would not conflict with any agricultural zoning, because the existing zoning P (Public Use) and M-2 (Heavy Industrial) is not for agricultural use. It would not conflict with a Williamson Act contract, because there are no Williamson Act contracts for land within the City and County of San Francisco. There is no urban agriculture on the project site.

The Proposed Project may include useable open space, including urban agriculture plots, on the rooftops of district parking structures on Parcels C1 and C2, if district parking is constructed. The space would be designed to be accessible from various locations throughout the project site. Inclusion of urban agriculture in the Proposed Project would support the *San Francisco General Plan's* Recreation and Open Space Element Policy 1.8.

In conclusion, the Proposed Project would have no impact on farmland and land zoned or contracted for agricultural uses. Therefore, no mitigation measures are necessary.

[4] California Department of Conservation, San Francisco Bay Area Important Farmland 2010. Available online at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/regional/2010/bay_area_fmmp2010.pdf. Accessed August 21, 2015.

Impact AG-2: The Proposed Project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland, nor would it result in the loss of or conversion of forest land to non-forest uses. ***(No Impact)***

There is no timberland (as defined by Public Resources Code Section 4526) or timberland zoned Timberland Production (as defined by Government Code 51104(g)) on the project site. None of the trees currently growing on or adjacent to the project site are managed for a public benefit, and therefore the project site is not "forest land" pursuant to Public Resources Code Section 12220(g). Thus, the Proposed Project would not result in the loss of forest land or the conversion of forest land to non-forest use. There would be no impact with respect to forest land or timberland, and no mitigation measures are necessary.

Cumulative Impacts

Impact C-AG-1: The Proposed Project, in combination with other past, present and reasonably foreseeable future projects in the vicinity, would not result in a cumulatively considerable contribution to a significant adverse cumulative impact on agricultural resources or forest land or timberland. ***(No Impact)***

The Proposed Project would have no impact on agricultural resources and forest land, nor would other proposed reasonably foreseeable cumulative projects in the vicinity because the entire City and County of San Francisco is considered "Urban and Built Up Land" by the California Department of Conservation. There are no areas designated near the project site as Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor are there areas under Williamson Act[5] contract. Therefore, there would be no cumulatively considerable contribution to a significant cumulative impact with respect to agricultural or forest resources, and no mitigation measures are necessary.

[5] The Williamson Act is a California law enacted in 1965 that provides property tax relief to owners of farmland and open space land in exchange for a 10-year agreement that the land will not be developed or converted into another use.

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5. OTHER CEQA CONSIDERATIONS

Chapter 5, Other CEQA Considerations, includes a discussion of growth-inducing impacts, significant unavoidable impacts, significant irreversible impacts, and areas of known controversy.

A. GROWTH-INDUCING IMPACTS

As required by Section 15126.2(d) of the California Environmental Quality Act (CEQA) Guidelines, an Environmental Impact Report (EIR) must consider the ways in which the Proposed Project could directly or indirectly foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth-inducing impacts can result from the elimination of obstacles to growth; through increased stimulation of economic activity that would, in turn, generate increased employment or demand for housing and public services; or from the implementation of policies or measures that do not effectively minimize premature or unplanned growth.

As described in detail in Chapter 3, Plans and Policies, implementation of the Proposed Project would require amendments to the *San Francisco General Plan* and Planning Code, adding a new Pier 70 Special Use District (SUD), which would establish specific land use controls for the project site and incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development*. The Zoning Maps would be amended to show changes from the current zoning (M-2 [Heavy Industrial] and P [Public]) to the proposed Pier 70 SUD zoning. Height limits on the 28-Acre Site would be increased to 90 feet (from 40 feet), except for a 100-foot-wide portion of the site adjacent to the shoreline that would remain at 40 feet. Height limits on both the Port-owned and most of the Pacific Gas and Electric (PG&E) owned portions of the Illinois Parcels would remain the same (65 feet); however, Planning Code text amendments would modify the existing height limit on the eastern portion of the Hoedown Yard (part of the Illinois Parcels) from 40 to 65 feet. These amendments and the resulting land use program would change the mix and types of land uses that could be developed on the project site, and would allow for increased building heights and density.

As described in detail in Chapter 2, Project Description, the project site is located in an underutilized infill area served by existing municipal infrastructure and public services. The Proposed Project would provide a land use program, under which certain parcels could be developed for primarily commercial-office or residential uses, with much of the ground floor dedicated to retail/art/light-industrial (RALI) uses. For the 28-Acre Site, up to a maximum of approximately 3,442,265 gross square feet (gsf) of construction of new buildings and improvements to existing structures could be constructed. The Illinois Parcels would include up to a maximum of approximately about 801,400 gsf of construction of new buildings. The

proposed land use program would be supported by existing and planned open space and recreational facilities, public services, and new or upgraded public utilities. Thus, improved and expanded infrastructure would be constructed as part of the Proposed Project to serve future development on the project site.

As described in Section 4.C, Population and Housing, the Proposed Project at full build-out would add approximately 3,025 new housing units under the Maximum Residential Scenario and 1,645 new housing units under the Maximum Commercial Scenario. Implementation of the Proposed Project under the Maximum Residential Scenario would result in residential development at a greater average housing density per acre (about 86 residential units per acre) than currently exists on the project site or in the immediate project vicinity (about 54 residential units per acre in this part of the South of Market [SOMA] Planning District).[1] In contrast, implementation of the Proposed Project under the Maximum Commercial Scenario would result in residential development at a lower average housing density per acre (about 47 residential units per acre) than currently exists on the project site or in the immediate project vicinity. Implementation of the Proposed Project would increase the City's overall housing stock, including affordable and family-sized units, and result in direct population growth on the project site as follows: approximately 6,868 new residents under the Maximum Residential Scenario and approximately 3,735 new residents under the Maximum Commercial Scenario. This population increase would be substantial in the context of the immediate project vicinity; however, in the citywide and regional context, the increase would represent about 2.4 percent of projected population growth in the City (280,465 persons) and about 0.1 percent of projected population growth in the San Francisco Bay Area region[2] (2,148,361 persons) between 2010 and 2040. In terms of households, the Proposed Project would represent about 3 percent of projected household growth in the City (101,539 households) and about 0.4 percent of projected household growth in the region (700,067 households) between 2010 and 2040.[3] With the proposed intensity of commercial uses on the project site, there would be a net increase of between 5,599 and 9,768 employees under the Maximum Residential Scenario and Maximum Commercial Scenario, respectively. The employment increases under the Maximum Residential Scenario would represent approximately 2.9 percent of the projected growth in City jobs (190,780) and approximately 0.5 percent of the projected growth in region wide jobs (1,119,930) between 2010 and 2040.[4] Under the Maximum Commercial Scenario, the employment increase at the project

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1 San Francisco Planning Department, *San Francisco General Plan*, Housing Element, Part I, Data and Needs Analysis, April 2015, Map 06, p. I.70. Available online at http://www.sf-planning.org/ftp/files/plans-and-programs/planning-for-the-city/housing-element/2014HousingElement-AllParts_ADOPTED_web.pdf. Accessed February 1, 2016.

2 The San Francisco Bay Area consists of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties.

3 ABAG, *Projections 2013*, pp. 20-21 and 74-75.

4 Ibid., pp. 22 and 75.

site would represent approximately 5.1 percent of the projected growth in City jobs and approximately 0.9 percent of the projected growth in region wide jobs between 2010 and 2040.[5]

Thus, population and employment growth would be a direct result of implementation of the Proposed Project under either scenario. Indirect growth (or unplanned growth) includes population and employment growth in surrounding neighborhoods resulting from an expansion of local infrastructure and public services. At the citywide and regional level, the Proposed Project would induce demand for 3,205 housing units under the Maximum Residential Scenario and 5,592 housing units under the Maximum Commercial Scenario due to construction of commercial, retail, restaurant, and RALI uses (refer to discussion in Section 4.C, Population and Housing, on pp. 4.C.31, 4.C.33, and 4.C.37). These amounts would be in excess of the amount of housing that would be provided with the Proposed Project under the Maximum Residential and Maximum Commercial Scenarios – 3,025 and 1,645 housing units, respectively. The proposed housing demand generated under either scenario would also be in excess of the projected supply of housing for the San Francisco Port Priority Development Area (PDA), which stretches 7.5 miles along the San Francisco Bay shoreline and includes the Pier 70 area, and is identified as a more commercial -oriented PDA. As such, the Proposed Project would be expected to generate the need for new housing within the City and region, but not in excess of the amount of new households that have been projected in the Port PDA and adjacent PDAs (28,377) and the City (101,539) between 2010 and 2040.[6]

Implementation of the Proposed Project would not result in substantial population and employment growth in the City that has not already been accounted for in local and regional planning efforts. Development of the Proposed Project would be in accord with local and regional planning efforts to accommodate population and employment growth in proximity to transit and services and where public services, utilities, and other municipal infrastructure have sufficient capacity. Local planning efforts include the Port's *Waterfront Land Use Plan* and Pier 70 master planning efforts; the Planning Department's Eastern Neighborhoods community planning and rezoning process, which included adoption of the East SOMA, Mission, Showplace Square/Potrero Hill, and Central Waterfront area plans; the adoption of the *Western SOMA Community Plan*; the adoption of the *Mission Bay Redevelopment Plan*; and the adoption of the *Rincon Hill Area Plan and Transit Center District Plan* in Downtown. Each of these area or community plans included amendments to the Planning Code such as rezoning, increased height limits, the removal of maximum densities, and the removal of minimum lot size requirements to enhance development flexibility and increase the housing development capacity within these plan areas. These changes, along with the existing San Francisco Housing Element policies that promote the development of new housing and the retention of existing housing stock and the

[5] Ibid.
[6] Ibid., p. 75.

adoption of new housing policies (especially those related to the creation of a streamlined permitting process for affordable housing projects), have resulted in the accelerated development of new housing units throughout the City, with the most rapid growth occurring within the SOMA Planning District (especially in the multi-unit housing categories).[7]

The SOMA Planning District, which includes the *Central Waterfront Area Plan* and the project site, accommodated approximately 36 percent of all housing growth in the City between 2010 and 2013, and accounted for approximately 54 percent of all new housing stock constructed in the City in 2014. The San Francisco Housing Element data indicates that the *Central Waterfront Area Plan* has the potential to accommodate up to 2,000 new housing units while the City as a whole has the potential to accommodate up to 47,020 net new residential units.[8] Thus, development of the Proposed Project at the proposed residential densities would continue (and potentially accelerate) local planning efforts to accommodate medium- to high-density housing in this area of the City (SOMA and Eastern Neighborhoods [*Central Waterfront Area Plan*]) and would continue the trend of providing new housing in multi-unit mixed use developments.

Regional planning efforts include the Association of Bay Area Government's (ABAG) *Plan Bay Area* and *Projections 2013*. *Plan Bay Area* is the nine-county Bay Area's Sustainable Communities Strategy for reducing greenhouse gas emissions to meet the statewide greenhouse gas reduction targets set forth in Senate Bill 375. ABAG's integrated transportation and land use approach is the primary strategy for meeting the reduction targets. This approach resulted in the creation of PDAs where future growth would be directed toward existing urban areas to increase housing near jobs and reduce urban sprawl. PDAs are defined as urban infill sites of at least 100 acres served by transit and designated for compact land development along with investments in community improvements and infrastructure. There are 12 PDAs within San Francisco. San Francisco's PDAs are projected to accommodate close to 92 percent of the anticipated number of households by 2040 and approximately 88 percent of San Francisco's projected population growth. At the regional level, designated PDAs are projected to accommodate close to 78 percent of the anticipated number of households by 2040 and approximately 69 percent of projected population growth.[9]

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[7] The South of Market Planning District encompasses the neighborhoods south of Market Street and east of 11th Street and U.S. 101 to the San Francisco Bay shoreline. See Map 6 of the Housing Element, p. I.70.

[8] San Francisco Planning Department, *San Francisco General Plan*, Housing Element, Part I, Data and Needs Analysis, April 2015, Table A-3 and Table I-56, pp. A-8 and I.67. Housing development capacity estimates are based on data for vacant sites, underutilized sites and underdeveloped sites. Available online at http://www.sf-planning.org/ftp/files/plans-and-programs/planning-for-the-city/housing-element/2014HousingElement-AllParts_ADOPTED_web.pdf. Accessed February 1, 2016.

[9] ABAG, *Projections 2013*, p. 71.

The project site is within the Port of San Francisco PDA, in the eastern portion of the City where the majority of San Francisco's 12 PDAs are located. The project site is bordered by the Mission Bay PDA to the north, San Francisco Bay to the east, the Eastern Neighborhoods PDA to the west, and the Bayview/Hunter's Point Shipyard/Candlestick Point PDA to the south.[10] ABAG's *Projections 2013* estimates that the City will gain about 280,465 persons, 101,539 households, and 190,780 jobs between 2010 and 2040 and that about 88 percent of the anticipated population growth, about 92 percent of the anticipated number of households, and about 85 percent of the anticipated number of jobs will occur in San Francisco's PDAs.[11] At the regional level, ABAG's *Projections 2013* indicates that about 69 percent of anticipated population growth, about 78 percent of anticipated housing growth, and about 85 percent of anticipated job growth would occur within PDAs.[12] When considered at the citywide and regional level the residential population and employment increases attributable to the Proposed Project would not be considered significant because they would not exceed the population, household, and employment growth increases identified by ABAG for the City or for the region. As such, the population and employment growth that would result from implementation of the Proposed Project would be within ABAG's projections for regional and citywide population and employment growth. Thus, while the Proposed Project in itself represents growth, the provision of new housing and employment opportunities would not result in substantial new growth in its immediately adjacent neighborhoods or in the City that has not previously been projected. Therefore, the Proposed Project's housing demand would not contribute to unplanned growth that has not already been accounted for in the City and Bay Area region.

Implementation of the Proposed Project would include the extension of the roadways on the 28-Acre Site and the extension of bicycle and walking paths and open space network through the project site. The roadway network and associated streetscape improvements would enhance the project site's accessibility. It would also be designed to connect the proposed new urban neighborhood to the existing fabric of the surrounding residential neighborhoods – Dogpatch and Potrero Hill (to the west), Mission Bay (to the north), and Bayview/Hunter's Point (to the south) – and the existing neighborhoods to the project site and San Francisco Bay's shoreline. As described in "Proposed Infrastructure and Utilities" in Chapter 2, Project Description, pp. 2.55-2.59, the Proposed Project would also include the installation of new infrastructure for the distribution of potable water, emergency firefighting water, and recycled water as well as for the conveyance of wastewater and stormwater flows. The Proposed Project's new infrastructure

[10] ABAG defines the Port of San Francisco PDA as a Mixed-Use Corridor Place Type (transit-served areas with a mix of moderate-density housing, services, retail, employment, and civic or cultural uses) and the other PDAs as Urban Neighborhood Place Types (primarily residential moderate-to-high density areas with local-serving retail services and other small business or older industrial uses.)

[11] ABAG, *Projections 2013*, p. 71.

[12] Ibid., p. 17.

would be constructed in trenches under the proposed roadway and open space network and would connect to the existing infrastructure, e.g., the proposed potable water distribution piping would connect to existing water mains located underneath 20th, Illinois, and 22nd streets. The Proposed Project, including its three wastewater and stormwater management options, would retain as much of the existing combined sewer system as can be used, where such continued use is acceptable to the San Francisco Public Utilities Commission,[13] and replace the existing 20th Street Pump Station to accommodate increased sewage and stormwater flows from existing development, the proposed development, and anticipated future development in the immediate area. In addition, the overhead electrical distribution would be replaced with a joint trench distribution system, and the existing natural gas distribution system would be extended to cover the entire project site. The new and extended electrical and gas distribution lines would follow the new roadway network, and any existing piping would be realigned within the new roadway network to serve the project site. The new distribution lines would connect to the existing 12-kV electricity lines and existing gas mains. The proposed new and extended municipal infrastructure would be constructed to serve the proposed development and connect to existing utility systems.

The Proposed Project would not extend water supply infrastructure or other public services beyond what is necessary to serve uses proposed under the Proposed Project's flexible land use program, nor would it result in development of new public services that would accommodate significant growth in the City or the region. Thus, proposed new construction and expansion, replacement, or upgrade of the water, electrical, and gas distribution system and other infrastructure; public roads; public facilities; and other community services and open space would not generate indirect population growth since those systems and services would primarily serve residents, employees, and visitors to the project site and the immediate project vicinity. Therefore, the Proposed Project would extend access to an area of the City that was previously inaccessible as well as provide additional infrastructure capacity, but it would provide access and capacity to serve itself and, in the case of the 20th Street Pump Station, the immediate project area comprised of the 20th Street sub-basin. The additional access and capacity would not be large enough to induce additional demand.

The proposed replacement of the 20th Street Pump Station and associated pipelines would accommodate wastewater flows from the project site as well as existing baseline and projected wastewater flows from anticipated cumulative development within the 20th Street sub-basin of the Islais Creek watershed. This basin is bounded by Illinois Street on the west, 20th Street on the north, 22nd Street and the former Potrero Power Plant on the south, and San Francisco Bay on the east. The 20th Street Historic Core site, Crane Cove Park, BAE Systems Ship Repair facility, and

[13] The San Francisco Public Utilities Commission currently operates a combined collection system for sanitary sewage and stormwater flows emanating from the project site. The Port also owns and maintains certain wastewater collection pipes on the project site.

the project site, including the 28-Acre Site and the Illinois Parcels, comprise the total area of the 20th Street sub-basin. The proposed replacement pump station would be designed to accommodate wastewater flows from the 20th Street sub-basin, i.e., existing development, development anticipated under the Proposed Project, and planned cumulative development on the 20th Street Historic Core site, Crane Cove Park, and the BAE Systems Ship Repair facility. Thus, it would not provide additional wastewater capacity beyond that planned for the 20th Street sub-basin. This could be characterized as the elimination of an obstacle to growth and an indirect growth-inducing impact.

Based on the preceding discussion and analysis, the projected population and employment growth attributable to the Proposed Project would not cause substantial population growth or concentration in employment that would result in significant growth-inducing impacts related to unplanned population, employment, or housing demand increases in the City or across the Bay Area region. To the extent that this growth would have been otherwise accommodated at other City or Bay Area locations, the Proposed Project would focus growth on underused or undeveloped infill sites near existing employment centers and existing and planned transit facilities, infrastructure, retail services, and cultural and recreational facilities. The Proposed Project would contribute to meeting the City and ABAG's housing production goals and would conform with local and regional efforts to focus growth and development into PDAs by creating compact communities with a diversity of housing, jobs, activities and services, and increasing housing supply, improving housing affordability, and increasing transportation efficiency and choices. Although improved and expanded infrastructure, public services, and transit improvements would be required to serve development on the project site, the improved and expanded infrastructure and services would not create additional capacity beyond what is required to serve the project-specific demand with the exception of the additional capacity designed into the replacement 20th Street Pump Station (to accommodate growth on the adjacent 20th Street Historic Core site, Crane Cove Park, and the BAE Systems Ship Repair facility). Therefore, the Proposed Project and related infrastructure improvements would not indirectly induce growth in the City or region. In this respect, implementation of the Proposed Project may be considered growth managing rather than growth inducing by facilitating urban in-fill, restoring a previously developed site that contains sources of contamination, and increasing open space.

While the Proposed Project in itself represents growth, as described above, the provision of new housing and employment opportunities would not encourage substantial new growth in the City that has not been previously projected or in an area of the City that has not been identified through local and regional planning processes as an area that could accommodate future population, housing, and employment growth. Thus, the Proposed Project would not have a substantial growth-inducing impact. No mitigation measures are necessary.

SOCIOECONOMIC EFFECTS

As stated in CEQA Guidelines Section 15358(b), CEQA requires review of the effects of a project that are related to a physical change to the environment. Social or economic impacts alone are not changes in physical conditions, and CEQA Guidelines Section 15382 provides that social or economic impacts may not be treated as significant effects on the environment. Evidence of social or economic impacts (e.g., property values, rent levels, neighborhood demographics, etc.) that do not contribute to, or are not caused by, physical impacts on the environment is not substantial evidence of a significant effect on the environment. However, CEQA Guidelines Section 15064(d)(e) provides that a social or economic change related to a physical change may be considered in determining whether the physical change is significant. Additionally, an EIR or other CEQA document must consider the reasonably foreseeable indirect environmental consequences or physical changes resulting from a project's economic or social changes. In short, social and economic effects are only relevant under CEQA if they would result in or are caused by an adverse physical impact on the environment.

As discussed in Section 4.C, Population and Housing, the project area is within the Port of San Francisco PDA in *Plan Bay Area*.[14] The Port of San Francisco PDA covers approximately 678 acres of public waterfront lands and stretches 7.5 miles from Fisherman's Wharf to India Basin, adjacent to Hunters Point Shipyard in the Bayview/Hunters Point neighborhood. *Plan Bay Area* notes that the Port of San Francisco PDA is one of 12 PDAs in the City that are served by existing utilities, infrastructure, and transit, and has the potential to accommodate future population and housing growth in the City and Bay Area region. Furthermore, *Plan Bay Area* forecasts that 88 percent of new population growth in the City is expected to take place in San Francisco's PDAs.[15]

The project site is also located within the *Central Waterfront Area Plan*, part of the larger Eastern Neighborhoods Planning Area. The Eastern Neighborhoods community planning process initiated by the Planning Department encourages new housing to be located at the Central Waterfront due to the area's proximity to transit and essential services.[16] The Housing Element identifies the Central Waterfront Area for growth of 2,000 residential units; however, this does not include the Pier 70 project site.[17] The *Central Waterfront Area Plan* encourages the transformation of traditional Port activities (i.e., industrial uses) to accommodate a substantial amount of new housing. The *Central Waterfront Area Plan* sees the Central Waterfront as

[14] ABAG, Plan Bay Area Priority Development Area Showcase, February 2015. Available online at http://gis.abag.ca.gov/website/PDAShowcase/. Accessed March 7, 2016.
[15] ABAG, *Projections 2013*,p. 71.
[16] San Francisco Planning Department, Data and Needs Analysis, p. A.3.
[17] Ibid., p. A.8.

"critical to supporting a much-needed increase in commercial services, enlivening open spaces, and creating a vibrant and cohesive residential neighborhood."[18]

Concerns have been raised in general throughout the City with regard to the loss of middle-income jobs and affordable housing. These socioeconomic effects are not considered environmental effects unless they are shown to result in physical impacts on the environment and must be linked to the action undergoing CEQA review. Under both the Maximum Residential Scenario and Maximum Commercial Scenario, the proposed uses would displace approximately 60 to 70 existing on-site employees. As part of the Proposed Project, these employees would be offered the opportunity to lease space on the project site or to relocate to other Port properties to the extent required under California Relocation Assistance Law (California Government Code Section 7260 et seq.), and applicable regulation. The Proposed Project would also generate direct, temporary growth in construction jobs that could relieve some of the loss in construction employment that has occurred since the 2007-2008 mortgage crisis and subsequent recession. As of July 2014, the loss in construction employment since 2007 in the five-county subregion of San Francisco, Alameda, Contra Costa, Marin, and San Mateo counties stands at about 15,000 jobs.[19]

No housing units are located on the project site and the Proposed Project would not displace existing housing or affordable housing; however, new permanent jobs generated by the Proposed Project (approximately 5,599 jobs under the Maximum Residential Scenario and approximately 9,768 jobs under the Maximum Commercial Scenario) would create a demand for housing in San Francisco in excess of the on-site residential development (approximately 3,025 new residential units under the Maximum Residential Scenario and approximately 1,645 new residential units under the Maximum Commercial Scenario). Anticipated household growth in adjacent PDAs (28,377), at the Citywide level (101,539), and at the regional level (700,067) estimated in ABAG's *Projections 2013* could accommodate this additional demand. Nonetheless, the increased population from new jobs or housing, in addition to regional economic trends favoring professional jobs, could result in displacement of lower-income housing and middle-income jobs independent of the Proposed Project.

By increasing the supply of both market-rate and affordable housing consistent with regional growth projections, the Proposed Project would provide some relief to the City's housing market pressures. However, what effect development would have on housing affordability is a matter of considerable controversy. While there is general consensus that the high cost of market-rate

[18] City and County of San Francisco, *Central Waterfront Area Plan*, December 2008, p. 21.

[19] California Employment Development Department, *Regional Economic Analysis Profile: San Francisco Bay Area Economic Market*, February 2015. Available online at http://www.labormarketinfo.edd.ca.gov/Publications/REA-Reports/SanFranciscoBayArea-REAP2015.pdf. Accessed November 17, 2015.

housing and the limited supply of affordable housing in San Francisco are causing displacement of lower-income residents in the City, opinions differ on the underlying causes.

The City Office of the Controller – Office of Economic Analysis determined that new market-rate housing in San Francisco has the effect of lowering, rather than raising, housing values at the local and citywide level.[20,21] Research also indicates that at the regional scale, producing more market-rate housing will result in decreased housing prices, and reduce displacement pressures (although not as effectively as subsidized housing). However, at the local level, market-rate housing would not necessarily have the same effects as at the regional scale, due to a mismatch between demand and supply.[22] The influx of real estate investment and higher income, higher educated residents can increase gentrification of a neighborhood, with displacement of households being a negative outcome.

CEQA prohibits the finding of significant impacts that are not based on substantial evidence of adverse physical changes to the environment. Therefore, these social and economic effects are beyond the scope of this EIR and should be addressed through the City's planning and policy development processes. Changes to the environment as a result of the Proposed Project are addressed in the appropriate environmental topics in this EIR.

B. SIGNIFICANT UNAVOIDABLE IMPACTS

In accordance with Section 21067 of CEQA and with Sections 15126(b) and 15126.2(b) of the CEQA Guidelines, the purpose of this section is to identify significant environmental impacts that could not be eliminated or reduced to less-than-significant levels by implementation of mitigation measures included in the Proposed Project or identified in Chapter 4, Environmental Setting and Impacts. The findings of significant impacts are subject to final determination by the San Francisco Planning Commission as part of the certification process for this EIR. If necessary, this chapter will be revised in the Final EIR to reflect the findings of the Planning Commission.

The Proposed Project would result in significant and unavoidable project-level and cumulative impacts described below.

[20] City and County of San Francisco, City Office of the Controller – Office of Economic Analysis, *Potential Effects of Limiting Market-Rate Housing in the Mission*, September 10, 2015.

[21] The analysis further determined that locally imposing limits on market-rate housing in the City would, in general, place greater upward pressure on City housing prices, and reduce affordable housing resources to a greater extent than if no limit on market-rate housing was imposed.

[22] Berkeley Institute of Governmental Studies (IGS), *Housing Production, Filtering and Displacement: Untangling the Relationships*, May 2016.

TRANSPORTATION

As identified in Section 4.E, Transportation and Circulation, the following transportation impacts would be significant and unavoidable under both the Maximum Residential Scenario and the Maximum Commercial Scenario even with implementation of mitigation measures identified in this EIR. In some cases, mitigation measures would reduce the significant impact, but not to less-than-significant levels.

- Significant and unavoidable impacts would occur on one individual Muni route (the 48 Quintara/24th Street). With implementation of the Proposed Project, the Muni route would exceed the 85 percent capacity utilization standard in the a.m. and p.m. peak hours in both the inbound and outbound directions. With implementation of Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed, the capacity on the bus route could be increased by adding buses during the peak hours; by using higher-capacity vehicles; by adding a new Muni service route in the area; or by increasing transit travel speeds along the routes. Since the sources of funding to operate additional buses, expand bus zones, or increase travel speeds are not identified, the mitigation measure is considered uncertain, and this impact would remain significant and unavoidable.
- The Proposed Project's loading demand during the peak loading hour would not be adequately accommodated by proposed on-site/off-street loading supply or in proposed on-street loading zones, which may create hazardous conditions or significant delays for transit, bicycles, or pedestrians. Implementation of Mitigation Measure M-TR-12A: Coordinate Deliveries, and Mitigation Measure M-TR-12B: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed, may not fully resolve the loading shortfall, as the project's Transportation Coordinator may not be able to shift on-site delivery times. Additionally, there may not be an adequate supply of on-street general purpose parking spaces to convert to commercial loading spaces such that the loading shortfall can be accommodated on-street. Thus, even with implementation of Mitigation Measures M-TR-12A and M-TR-12B, the Proposed Project's loading impacts would remain significant and unavoidable.
- The Proposed Project would contribute considerably to significant cumulative transit impacts on the 48 Quintara/24th Street and 22 Fillmore bus routes. With implementation of Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed, the capacity on the bus route could be increased by adding buses during the peak hours; by using higher-capacity vehicles; by adding a new Muni service route in this area; or by increasing transit travel speeds along the routes. Additionally, implementation of Mitigation Measure M-C-TR-4A: Increase capacity on the 48 Quintara/24th Street bus route under the Maximum Residential Scenario, and Mitigation Measure M-C-TR-4B: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario, would assist in reducing the considerable contribution to a significant cumulative impact. However, since the sources of funding to operate additional buses, expand bus zones, or increase travel speeds are not identified, the mitigation measures are uncertain, and this impact would remain significant and unavoidable.

NOISE

As identified in Section 4.F, Noise and Vibration, the following noise impacts would be significant and unavoidable under both the Maximum Residential Scenario and the Maximum Commercial Scenario even with implementation of mitigation measures identified in this EIR. In some cases, mitigation measures would reduce the significant impact, but not to less-than-significant levels.

- The closest existing off-site sensitive receptors located 140 feet to 200 feet from the closest site boundary (northwest corner of Parcel PKN) along with future on-site sensitive receptors would be subject to substantial temporary or periodic increases in ambient noise levels in the project vicinity above levels existing without the project. With implementation of noise controls during all construction phases (specified in Mitigation Measure M-NO-1: Construction Noise Control Plan) as well as implementation of noise controls during pile driving (specified in Mitigation Measure M-NO-2: Noise Control Measures During Pile Driving), the potential for noise disturbance of existing off-site residents (assumed to be occupied during the 11-year construction period) approximately 140 to 200 feet to the northwest would be reduced. However, even with implementation of these noise controls, the feasibility of quieter, alternative pile driving methods in all areas cannot be determined at this time and also the potential would still exist that combined noise levels from simultaneous operation of the noisiest types of construction equipment could still exceed the Ambient+10 decibel A-weighted threshold. Given this uncertainty and the potential 11-year duration of this activity, this impact is conservatively considered to remain significant and unavoidable with mitigation (Mitigation Measures M-NO-1 and M-NO-2).
- The Proposed Project would result in permanent increases in ambient noise levels along some roadway segments in the project site vicinity. Reduction in project-related one-way traffic of up to 20 percent through implementation of transportation demand management (TDM) measures required in Mitigation Measure M-AQ-1f: Transportation Demand Management could reduce noise levels by up to 1 decibel (dB). Therefore, implementation of M-AQ-1f would reduce the above significant noise increases to less than significant with mitigation at all of the above street segments except for three road segments 22nd Street from Third Street to Illinois Street, 22nd Street east of Illinois Street (on the project site), and Illinois Street from the future 21st Street and 22nd Street (adjacent to project site). Therefore, this impact would remain significant and unavoidable with mitigation.
- Operation of the Proposed Project, in combination with other cumulative development, would cause a substantial permanent increase in ambient noise levels in the project vicinity. Of the 79 road segments examined, the Proposed Project would contribute considerably to cumulative traffic noise increases along 22nd Street (east of Third Street to east of Illinois Street) and Illinois Street (Mariposa Street to 22nd Street). These street segments either directly adjoin the project site or are within two blocks of the project site and provide direct access to the site. Reduction in project-related one-way traffic of up to 20 percent through implementation of TDM measures required in Mitigation Measure M-AQ-1f: Transportation Demand Management, could result in reductions of one-way traffic by up to 20 percent, and such reductions could provide noise level reductions of up

to 1.0 dB. Such reductions would reduce the above significant noise increases to less than significant along Illinois Street (between Mariposa Street and the proposed 23rd Street) and 22nd Street (west of Third Street) but would not be sufficient to reduce cumulative noise increases on any of the other above-listed street segments to less-than-significant levels (i.e., below threshold levels). Cumulative traffic noise increases would still exceed the significance thresholds for traffic noise increases on some of the above-listed street segments by up to 2.0 dBA when compared to future baseline noise levels (2040) and by up to 14.2 dBA when compared to existing baseline noise levels (2020). Therefore, the Proposed Project would result in a considerable contribution to this cumulative impact, which is significant and unavoidable with mitigation.

AIR QUALITY

As identified in Section 4.G, Air Quality, the following air quality impacts would be significant and unavoidable under both the Maximum Residential Scenario and the Maximum Commercial Scenario even with implementation of mitigation measures identified in this EIR. In some cases, mitigation measures would reduce the significant impact, but not to less-than-significant levels.

- During construction, the Proposed Project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants. Implementation of Mitigation Measures M-AQ-1a through M-AQ-1h would substantially reduce emissions of criteria pollutants and fugitive dust; however, construction-related emissions would remain significant during construction of Phases 3, 4, and 5 when operational emissions are also considered. Therefore, Impact AQ-1 would remain significant and unavoidable with mitigation.
- At project build-out, the Proposed Project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Even with implementation of Mitigation Measures M-AQ-1b through M-AQ-1g, criteria pollutant emissions from operation of the Proposed Project would still be significant. Consequently, implementation of Mitigation Measure M-AQ-1h: Emission Offsets of Operational Emissions, would be required to reduce emissions to the extent feasible. If Mitigation Measure M-AQ-1h is implemented via a directly funded or implemented offset project, it could have the potential to reduce the impact to a less-than-significant level but only if the timing of the offsets could be documented prior to the occupancy of Phase 3 and ensured for the life of the project. Therefore, the residual impact of project emissions during operation at build-out is conservatively considered significant and unavoidable with mitigation, acknowledging the assumption that the project sponsors would implement Mitigation Measures M-AQ-1a though M-AQ-1h (Emission Offsets).
- The Proposed Project, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative regional air quality impacts. Implementation of Mitigation Measures M-AQ-1a through M-AQ-1h would reduce this impact, but not to a less-than-significant level. Therefore, Impact C-AQ-1 would remain significant and unavoidable with mitigation.

C. SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL IMPACTS

In accordance with Section 21100 (b)(2)(B) of CEQA, and Section 15126.2(c) of the CEQA Guidelines, an EIR must identify any significant irreversible environmental changes that could result from implementation of the Proposed Project. This may include current or future uses of non-renewable resources and secondary or growth-inducing impacts that commit future generations to similar uses. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified.

IRREVERSIBLE CHANGES FROM ENVIRONMENTAL ACTIONS

The project site contains 12 of the 44 contributing historic features and one of the non-contributing features (Slipways 5 through 8) of the National Register of Historic Places-listed Union Iron Works (UIW) Historic District, which illustrate Pier 70's use as an iron and steel manufacturing and shipbuilding area. As described throughout this EIR, the Proposed Project would result in rehabilitation and adaptive reuse of three contributors to the UIW Historic District (Buildings 2, 12, and 21) in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Also, the majority of the existing portion of Irish Hill, a contributing feature, would be retained. The seven remaining contributing structures on the project site (Buildings 11, 15, 16, 19, 25, 32, and 66) would be demolished as part of the Proposed Project. In addition, the single non-contributing structure on the site, Slipways 5 through 8, currently covered by fill and asphalt, would be partially demolished. As a result of the Proposed Project, future generations would be committed to the demolition of Buildings 11, 15, 16, 19, 25, 32, and 66. Through the rehabilitation and re-use of three contributing buildings and the retention of the remnant Irish Hill (a contributing landscape feature), and implementation of Mitigation Measures 1-CP-1a, I-CP-2, and 1-CR-8, the Proposed Project would not materially impair the significance of the UIW Historic District. The loss of seven contributing buildings is irreversible, but would constitute a less-than-significant impact to historic architectural resources under CEQA because similar buildings would remain and the UIW Historic District would continue to convey its significance.

No significant irreversible environmental damage related to hazardous materials is anticipated to occur with implementation of the Proposed Project. Compliance with Federal, State, and local regulations related to residential and commercial uses identified in Section 4.P, Hazards and Hazardous Materials, would reduce the possibility that hazardous substances from the demolition, construction, and operation of Proposed Project would cause significant and unavoidable environmental damage.

The Proposed Project would involve excavation of soils for grading and construction of the 15- to 27-foot-deep basements planned on 17 of the 20 parcels. No basement levels are planned under

existing Buildings 2, 12, or 21. The Proposed Project would raise the grade of the 28-Acre Site and low-lying portions of the Illinois Parcels by adding up to 5 feet of fill in order to help protect against flooding and projected future sea level rise, as described in Chapter 2, Project Description, on pp. 2.71-2.74. These excavation and grading activities would result in topographic changes to the 28-Acre Site to which future generations would be committed. However, these grading adaptations would not be excessive or greater than what is necessary to achieve flood abatement goals.

No other irreversible permanent changes such as those that might result from construction of a large-scale mining project, hydroelectric dam, or other industrial project would result from development of the Proposed Project.

CONSUMPTION OF NONRENEWABLE RESOURCES

Consumption of nonrenewable resources includes increased energy consumption, conversion of agricultural lands to urban uses, and loss of access to mineral reserves. No agricultural lands would be converted and no access to mining reserves would be lost with construction of the Proposed Project under either the Maximum Residential Scenario or the Maximum Commercial Scenario.

Implementation of the Proposed Project under either development scenario would commit future generations to an irreversible commitment of energy resources in the form of usage of nonrenewable fossil fuels, due to vehicle and equipment use during demolition, construction, and operation of the Proposed Project. Because individual buildings would be required to meet or exceed the energy conservation requirements in the San Francisco Green Building Ordinance, which itself includes energy conservation requirements that exceed those in the California Building Code, energy would not be used in a wasteful, inefficient, or unnecessary manner.

Resources consumed during demolition, construction, and operation would include lumber, concrete, gravel, asphalt, masonry, metals, and water. Similar to the existing uses on the project site, the Proposed Project would irreversibly use water and solid waste landfill resources. However, the Proposed Project would not involve a large commitment of resources relative to existing conditions and also relative to supply, nor would it consume any of those resources wastefully.

The Proposed Project under either development scenario would introduce new residential, commercial-office, open space, and retail/restaurant uses to the project site. The project site is partially served by existing utilities and construction of new utility infrastructure would be necessary, as further described below.

At present, approximately 98 percent of the 28-Acre Site and approximately 43 percent of the Illinois Parcels are covered by impervious surface. The Proposed Project would result in approximately 88 percent impervious surface coverage on the 28-Acre Site and approximately 87 percent impervious surface coverage on the Illinois Parcels. Therefore, construction of the Proposed Project would decrease the amount of impervious surface area on the project site. Accordingly, the Proposed Project would not increase the amount of surface runoff, or exceed the capacity of the existing drainage system. The amount of impermeable surface area that receives rain under existing conditions would change with project development. However, it is anticipated that there would be no net increase in the amount of stormwater runoff with the Proposed Project because the City's Stormwater Management Ordinance requires reductions in at-source runoff. The Proposed Project under either development scenario would meet these requirements; however, the majority of stormwater would continue to be handled by the City's combined sewer collection system.

To provide water for drinking and firefighting needs, the Proposed Project would include construction of potable water distribution piping in trenches located under the planned roadways. This new water distribution piping would connect to the existing water mains located underneath 20th, Illinois, and 22nd streets. To meet firefighting water requirements for the Auxiliary Water Supply System (AWSS), the Proposed Project may be required to include two sources of water delivery (connections to two separate water mains), additional AWSS high-pressure distribution piping, an AWSS cistern, and potable water supply system equipment. The Proposed Project would include the diversion and reuse of graywater and rainwater for toilet and urinal flushing and irrigation.

In addition to the Proposed Project, there are four proposed variants on features of the Proposed Project that focus on sustainability. The sustainability variants modify one limited feature or aspect of the Proposed Project, in which the proposed variants—the Reduced Off-Haul Variant, the District Energy System Variant, the Wastewater Treatment and Reuse System Variant, and the Automated Waste Collection System Variant—specifically address methods to reduce the consumption of non-renewable energy and water resources. As such, the Proposed Project, with implementation of any of the four sustainability variants identified above, would further reduce its commitment to those resources and its consumption of any of those resources such that no significant irreversible impacts would occur.

The Proposed Project under both development scenarios would require construction of new and replacement water or wastewater collection, treatment, and distribution facilities to serve the project site, and, in the case of the wastewater system, the immediate area comprised of the 20th Street sub-basin. The Proposed Project would be adequately served by water supply resources identified in the SFPUC's *2010 Urban Water Management Plan for the City and County of San Francisco* and *2013 Water Availability Study*, which includes all known or

expected development projects and projected development in San Francisco through 2035. Furthermore, the Proposed Project would not involve new or expanded water supply resources or entitlements. Therefore, service providers would have the capacity to provide for the proposed level of development on the project site.

D. AREAS OF KNOWN CONTROVERSY AND ISSUES TO BE RESOLVED

The Planning Department published a Notice of Preparation of an EIR (NOP) on May 6, 2015, announcing its intent to prepare and distribute an EIR (the NOP is included in this EIR as Appendix A). The public review period began on May 6, 2015, and ended on June 5, 2015. During the NOP public review period, five comment letters were submitted to the Planning Department by public agencies and other interested parties. On May 28, 2015, a public scoping meeting was held and four speakers contributed comments. A Notice of Preparation Public Comments Summary Report was prepared.[23]

Comments on the NOP raised the following issues:

Plans and Policies: Comments raised issues concerning the need for the EIR to evaluate conflicts between the Proposed Project and the goals of the *Central Waterfront Area Plan*. The Proposed Project's compatibility with applicable plans and policies is discussed in Chapter 3, Plans and Policies.

Land Use and Land Use Planning: A comment noted that the EIR should evaluate physical land use impacts from the Proposed Project and other past, present, and reasonably foreseeable projects. Project-specific and cumulative land use impacts are discussed in Section 4.B, Land Use and Land Use Planning.

Cultural Resources: Comments raised issues concerning impacts of the Proposed Project on the historic and existing industrial land uses of the area. The Proposed Project's impacts on historical resources are evaluated in Section 4.D, Cultural Resources (Historic Architectural Resources), pp. 4.D.33-4.D.115, and land use compatibility is addressed in Section 4.B, Land Use and Land Use Planning, pp. 4.B.24-4.B.28.

Transportation and Circulation: Comments raised issues concerning the Proposed Project's connectivity with the rest of San Francisco, particularly by way of 20th and 22nd streets; traffic and pedestrian safety impacts, specifically at the Illinois Parcels; traffic conflicts between the Proposed Project and the trucking route along Illinois Street, as well as noise, air quality, and

[23] *Pier 70 Mixed-Use District EIR NOP Public Scoping Summary*, September 16, 2015.

pedestrian safety impacts created by trucks; the Transportation Impact Study prepared for the EIR; a Transportation Demand Management Plan that would reduce vehicle trips; mitigation measures to be included in the EIR; transportation impact fees; and consistency with the Waterfront Transportation Assessment.

The Proposed Project's Transportation Demand Management Plan is described in Section E, Transportation and Circulation, on pp. 4.E.46-4.E.47. The proposed roadway network is also described in Chapter 2 on pp. 2.49-2.51. Section 4.E, Transportation and Circulation, addresses applicable regulatory compliance, and the construction and operation impacts that the Proposed Project's transportation and land use changes would have on traffic, transit, pedestrian, and circulation conditions. Section 4.E summarizes the information in the Transportation Impact Study prepared for the Proposed Project. Mitigation measures are presented as part of the impact evaluation in Section 4.E. Proposed roadway improvements are discussed in Chapter 2, on pp. 2.49-2.51, and analyzed in Section 4.E, Transportation and Circulation. The Proposed Project's noise and air quality impacts are analyzed in Section 4.F, Noise and Vibration, and Section 4.G, Air Quality, respectively.

Noise: A comment asserted that the EIR should evaluate the noise impacts from nearby industrial uses (e.g., BAE Systems Ship Repair facility, the Pacific Gas and Electric Company (PG&E) Potrero Substation, and American Industrial Center) on future residents and employees. Section 4.F, Noise, describes the existing noise environment in the project area and evaluates the potential noise impacts on future residents and employees.

Air Quality: A comment asserted that the EIR should evaluate the air quality and odor impacts from nearby industrial uses on future residents and employees. Section 4.G, Air Quality, discusses the existing air quality conditions in the project area and evaluates the Proposed Project's potential air quality impacts during construction and operation. The section includes an assessment of potential odor impacts.

Hazards and Hazardous Materials: Comments raised concerns about serpentine soils, potential soil/groundwater contamination from underground tanks, and contaminated soil from past industrial uses on the project site, and the risks to future residents and employees. One comment recommended that a full environmental remediation of the project site be considered, in accordance with Proposition D. Existing conditions at the project site and impacts of the Proposed Project in regard to hazards and hazardous materials are described in Section 4.P, Hazards and Hazardous Materials.

Recreation: A comment stated that the EIR should consider the Bay Area Water Trail, and that storage, access, and landing areas remain available for non-motorized small watercraft (e.g.,

kayaks and canoes) who wish to use San Francisco Bay. The *Enhanced Water Trail Plan* is discussed in Section 4.J, Recreation.

Utilities: Comments raised issues concerning the need for the EIR to include a discussion of City of San Francisco Ordinances regarding irrigation, use of non-potable water during construction, and water efficiency; stormwater management requirements and system configuration; the proposed recycled water system; updates to the Water Supply Assessment; and the design of proposed utility systems, including the water distribution, wastewater, stormwater, and sewer/storm drain systems. The utilities and service system design for the Proposed Project is described in Chapter 2, Project Description, pp. 2.19-2.20. Section 4.K, Utilities and Service Systems, addresses the potential effects of the Proposed Project on existing public utilities and service systems, including water supply, wastewater, and stormwater, as well as applicable regulatory compliance and the design of proposed systems.

Cumulative Impacts: A comment noted several projects that should be considered in the cumulative analysis, including the adjacent PG&E Site (potential for redevelopment), water taxis, a second BART tunnel, and any other miscellaneous projects in the adjacent Dogpatch neighborhood. Applicable cumulative projects considered in the EIR are presented in Section 4.A, Introduction to Chapter 4, pp. 4.A.4-4.A.17, and analyzed in applicable sections throughout Chapter 4, Environmental Setting and Impacts.

Alternatives: Comments suggested two alternatives to be considered in the EIR: a Reduced Parking Alternative and a Maximum Housing Alternative. EIR Chapter 7, Alternatives, presents and analyzes a reasonable range of feasible alternatives to the Proposed Project. Alternatives are presented and analyzed in this EIR for the purpose of fostering informed decision-making by presenting a range of alternatives that could lessen the significant and less-than-significant impacts identified for the Proposed Project, while feasibly attaining most of the basic project objectives.

General: A comment stated that the EIR should incorporate factual, direct statements as opposed to vague terminology. The EIR follows the Planning Department's *Environmental Review Guidelines*. Terms are defined in text or in footnotes in each of the chapters. A list of acronyms and abbreviations used in the EIR is presented on pp. x-xiii.

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6. PROJECT VARIANTS

Chapter 6, Project Variants, discusses four variations on features of the Proposed Project that are under consideration by the project sponsors: a Reduced Off-Haul Variant, a District Energy System Variant, a Wastewater Treatment and Reuse System (WTRS) Variant, and an Automated Waste Collection System (AWCS) Variant. The variants modify one limited feature or aspect of the Proposed Project, unlike the Alternatives to the Proposed Project analyzed in Chapter 7, Alternatives, which provide a different features or characteristics to the Proposed Project. Therefore, each variant is the same as the Proposed Project except for the specific variation described. The variants are being considered by the project sponsors, but have not been confirmed to be part of the Proposed Project. Each variant could be selected by the project sponsors and decision-makers, and any variant or combination of variants could be included in the Proposed Project as part of an approval action.

This chapter describes each variant and its environmental impacts that would be different from those identified for the Proposed Project in Chapter 4, Environmental Setting and Impacts. If not included in the analysis, the environmental impacts of the variant would be the same as those for the Proposed Project. Mitigation and improvement measures applicable to the Proposed Project and to the variant are identified.

A. REDUCED OFF-HAUL VARIANT

Introduction

The Reduced Off-Haul Variant is a construction-related variant that focuses on minimizing the overall volume of excavated soils and the number of off-haul truck trips required for the transport and disposal of excavated soils. The strategy for achieving this reduction is three-fold: (1) modify the preliminary grading plan developed for the Proposed Project[1] to raise the base elevation for a portion of the 28-Acre Site; (2) eliminate the proposed 15-foot-deep below-grade basement levels at selected locations on the 28-Acre Site and extend the footprint of one proposed 15-foot-deep below-grade basement level; and (3) eliminate a portion of one of the two below-grade basement levels on Parcel C1.

The combination of the proposed increase to the base elevation on a portion of the 28-Acre Site and the modifications to the below-grade basement level parking program would result in an approximately 56 percent reduction in the volume of excavated soils that would need to be transported off site (from approximately 340,000 cubic yards under the Proposed Project to

[1] BKF, *Pier 70 Redevelopment Preliminary Grading Plan*, March 24, 2015.

approximately 150,000 cubic yards under the Reduced Off-Haul Variant). As with the Proposed Project, under the Reduced Off-Haul Variant clean fill would be imported to the project site and any excavated soils appropriate for reuse, as determined in the Pier 70 Risk Management Plan, would remain on site to help protect against flooding and projected future sea level rise. Under the variant, there would be a slight increase in the volume of imported clean fill (from approximately 20,000 cubic yards under the Proposed Project to approximately 21,150 cubic yards). The need for slightly more imported clean fill under this variant is likely a reflection of the assumptions regarding the retaining wall and the area of exposed landscaping as well as rounding. Overall, the Reduced Off-Haul Variant would result in an approximately 52 percent reduction in the combined earth movement. Although the grading plan for this variant would result in an increase to the base elevation of a portion of the 28-Acre Site, it would not conflict with implementation of the transportation and circulation improvements, new and upgraded utilities and infrastructure, geotechnical and shoreline improvements, public open space, and other sea-level rise adaptation strategies. Under this variant, as with the Proposed Project, the potential hazard of liquefaction and lateral spreading of the underlying soils in the case of a major earthquake would be addressed in part by reinforcing slopes at the site with a structural wall or ground improvement along the northeastern and southeastern portions of the 28-Acre Site. Structural wall solutions may include, but are not limited to, tied-back sheet pile walls (interlocking sheets of steel), rows of secant piles (interlocking piles), and king-pile walls (wider piles connected by sheeting). Ground improvement may consist of treatments such as deep soil mixing to add a cement slurry to strengthen the existing soil, or vibratory methods such as vibro-compaction, vibro-replacement, and dynamic compaction to densify and strengthen the existing soil.

The Reduced Off-Haul Variant does not include any changes to the land use programs for the Maximum Residential Scenario or the Maximum Commercial Scenario for the Proposed Project. As discussed in Chapter 2, Project Description, pp. 2.1-2.3, the above-grade development options for Parcel C1 include development of an above-grade parking structure, a residential building, or a commercial building. The Parcel C1 development options would remain applicable to this variant. The land use program and project site improvements would be implemented in a similar fashion as those for the Proposed Project.

Description

PROPOSED REDUCED OFF-HAUL VARIANT GRADING PLAN

The 35-acre project site (the 28-Acre Site and 7-acre Illinois Parcels) has varying topography, sloping up from the San Francisco Bay shoreline, with an approximately 30-foot increase in elevation at the western extent of the 28-Acre Site. (See Section 4.N, Geology and Soils, pp. 4.N.2-4.N.5, for a detailed discussion of the project site's topography and underlying soil

strata.) As with the Proposed Project, the Reduced Off-Haul Variant would involve the excavation of soils for grading and construction of the 15- to 27-foot-deep basements planned on some of the development parcels. The preliminary grading plan developed for the variant, similar to that for the Proposed Project, calls for an increase in the base elevation of the 28-Acre Site and low-lying portions of the Illinois Parcels, the removal of the northern spur of the remnant of Irish Hill for construction of the new 21st Street, and the development of retaining walls along the sides of the new 21st Street (for the protection of Building 116 and the remnant of Irish Hill) and along the reconfigured 22nd Street (to account for the proposed elevation difference between the streets and adjacent ground surfaces/development pads).[2] Unlike the Proposed Project, under the Reduced Off-Haul Variant a continuous retaining wall would be developed along the base of the remnant of Irish Hill (paralleling the western boundaries of Parcels C1 and C2) and would connect the retaining walls along the new 21st and 22nd streets. As a result, a segment of the proposed retaining wall along the northern side of the new 22nd Street adjacent to Parcel C2 would not be constructed under the Reduced Off-Haul Variant.

To provide flexibility for site grading work anticipated as part of the preservation and rehabilitation of Building 12 (see Chapter 2, Project Description, pp. 2.68-2.70), the Reduced Off-Haul Variant would include two of the three grading options developed for the Proposed Project (Grading Options 2 and 3). Grading Option 1: Raise the Exterior Grade Only would not be an applicable option under this variant because the exterior grade around the perimeter of Building 12 (along new Maryland, 22nd, and Louisiana streets) would be increased by roughly 5 to 8 feet over that for the Proposed Project (approximately 4 feet). Thus, the relationship between the current finished floor elevation for Building 12 (102.4 feet Project Datum), the structural frame of Building 12, and the grades of the surrounding streets presumed under Grading Option 1 would not be applicable to the Reduced Off-Haul Variant.

Under the Reduced Off-Haul Variant, the portion of the 28-Acre Site comprised of Parcels C2, E1 through E4, F, G, H1, and H2; Building 21; and the new Maryland, Louisiana, and 22nd streets public rights-of-way would be developed at slightly higher base elevations and with slightly different slope gradients than under the Proposed Project. According to the preliminary grading plan for the Reduced Off-Haul Variant, the proposed increases in the base elevations (over those for the Proposed Project) would be approximately 3 feet in the vicinity of Parcel C2 at the midpoint of new Louisiana Street (between new 21st and 22nd streets), approximately 5 feet in the vicinity of Building 12 and Parcels E2, G, and H1 at the corner of new Maryland and 22nd streets, approximately 6 feet in the vicinity of Building 12 and Parcels E1 and E2 at the

[2] BKF, *Pier 70 Redevelopment Preliminary Grading Plan for Highest Height Grading Variant Scenario*, March 1, 2016.

midpoint of new Maryland Street (between new 21st and 22nd streets), and approximately 8 feet in the vicinity of Parcels C2 and F at the corner of new Louisiana and 22nd streets.[3]

Slipways Commons

Under the Proposed Project, the proposed Slipways Commons would be relatively flat from west to east between the midpoint of new Maryland Street (between new 21st and 22nd streets) east to the San Francisco Bay shoreline (an elevation change of less than 1 foot). Under the Reduced Off-Haul Variant, the proposed Slipways Commons would be developed with a higher base elevation closer to the new Maryland Street right-of-way (from 104 feet under the Proposed Project to 110 feet under this variant) and would slope from west to east at an approximately 1.6 percent gradient, which would be greater than that under the Proposed Project.

New Maryland Street

Under the Proposed Project, new Maryland Street would be relatively flat from north to south between new 21st and 22nd streets (an elevation change of less than 1 foot). North of new 21st Street toward the northern boundary of the 28-Acre Site there would be a south-to-north trending slope of approximately 1.4 percent. South of new 22nd Street there would be a south-to-north trending slope of approximately 0.7 percent (from the southern boundary of the 28-Acre Site toward the corner of new Maryland and 22nd streets). Under the Reduced Off-Haul Variant the new Maryland Street right-of-way would be developed with a higher base elevation than that for the Proposed Project, and would result in a slight south-to-north slope from the midpoint of new Maryland Street north toward new 21st Street. There would be no change north of new 21st Street toward the northern boundary and the BAE Systems Ship Repair site. The proposed change to the base elevation of the new Maryland Street right-of-way would also result in a change in the direction of the slope from the corner of new Maryland and 22nd streets (from a 0.7 percent south-to-north trending slope under the Proposed Project to a 1.9 percent north-to-south trending slope [toward the decommissioned Potrero Power Plant site immediately south of the 28-Acre Site]).

New 22nd Street

The existing segment of 22nd Street between Illinois Street and the western boundary of the 28-Acre Site would be rebuilt as part of the Proposed Project with a slight slope (0.2 percent) to the west near the intersection of 22nd/Illinois streets and a more discernible slope (3.2 percent) to the east from the westernmost extent of 22nd Street to the western boundary of the 28-Acre Site, a west-to-east elevation change of approximately 14 feet over that distance. Under the Reduced

[3] Ibid.

Off-Haul Variant there would be an approximately 4- to 6-foot increase to the base elevation of 22nd Street along the segment of the roadway adjacent to the proposed retaining walls on the northern and southern sides of the street. As evidenced by the change in the slope gradient for the existing north-south driveway that provides access to the Pacific Gas and Electric (PG&E) Substation (from 8.1 percent under the Proposed Project to 2.1 percent under this variant), this base elevation change would result in a gentler west-to-east slope over the segment of 22nd Street between Illinois Street and the western boundary of the 28-Acre Site than under the Proposed Project. As with the Proposed Project and as noted above, the southern side of 22nd Street (on each side of the existing PG&E Substation driveway) would be supported by retaining walls.

Under the Proposed Project, the slope of new 22nd Street between the western boundary of the 28-Acre Site and the eastern terminus of new 22nd Street would trend west to east with an elevation change of approximately 8 feet. With the Reduced Off-Haul Variant, the increase in the base elevation for the new 22nd Street right-of-way would result in an approximately 16-foot elevation change over the same distance and would lead to a steeper west-to-east trending slope than that under the Proposed Project. Overall, the change in elevation along the 22nd Street right-of-way between Illinois Street and the eastern terminus of new 22nd Street (from west to east toward the San Francisco Bay shoreline) would be approximately 23 feet (from 38 feet NAVD88 [127 Project Datum] to 15 feet NAVD88 [104 feet Project Datum]).

New Louisiana Street

Under the Proposed Project, the slope of new Louisiana Street (approximately 0.7 percent) would trend south to north from the corner of new Louisiana and 22nd streets north toward new 21st Street with an elevation change of approximately 4 feet. With the Reduced Off-Haul Variant, the increase in the base elevation for the new Louisiana Street right-of-way would result in an approximately 11-foot elevation change over the same distance, resulting in an approximately 2.4 percent south-to-north trending slope, which would be greater than the approximately 0.7 percent slope under the Proposed Project.

PROPOSED EXCAVATION

Under the Proposed Project, new construction on Parcels C1 and C2 would include 27-foot-deep below-grade basements, and new construction on Parcels D, E1 through E4, F, G, H1, and H2 would include 15-foot-deep below-grade basements. Under the Reduced Off-Haul Variant, new construction on Parcels E1 through E4, H1, and H2 would not include basements. In addition, under this variant new construction on Parcel C1 (which, as with the Proposed Project, could be developed as an above-grade parking garage, a residential building, or commercial building; all with two below-grade basement levels) would not include a portion of the lower level of the two below-grade basement levels (the eastern portion), and new construction on Parcel D would

include the extension of the excavation footprint for the 15-foot-deep below-grade basement level. The finished floor elevations for the proposed new structures on Parcels D and E1 through E4, and relocated Building 21 would remain the same as those under the Proposed Project. As described above, under the Reduced Off-Haul Variant the base elevation for development of new structures on Parcels C2, F, G, H1, and H2 would be increased by approximately 2 to 8 feet over that for the Proposed Project, with the greatest increase along the western boundary of the 28-Acre Site. As a result, the finished floor elevations on Parcels H1 and H2 would be slightly higher under this variant than those under the Proposed Project, approximately 4 and 2 feet higher, respectively. On Parcel C2, which would retain the two below-grade basement levels under the Proposed Project, the basement parking slab and finished floor elevations would be 3 feet higher under this variant than those under the Proposed Project. On Parcels F and G, both of which would retain the 15-foot-deep basement levels under the Proposed Project, the basement parking slab and finished floor elevations would be slightly higher under this variant than those under the Proposed Project, approximately 8 and 6 feet higher, respectively.

PROPOSED CONSTRUCTION PHASING

Under the Reduced Off-Haul Variant, demolition, excavation, site grading, and construction activities would be conducted according to the construction phases and the timing would be substantially the same as under the Proposed Project (see Figure 2.26: Proposed Phasing Plan – Maximum Residential Scenario, Figure 2.27: Proposed Phasing Plan – Maximum Commercial Scenario, Table 2.5: Project Construction Phasing – Maximum Residential Scenario, and Table 2.6: Project Construction Phasing – Maximum Commercial Scenario, in Chapter 2, Project Description, pp. 2.83-2.84). The Reduced Off-Haul Variant would include demolition of the same buildings as well as construction of the same shoreline improvements and transportation, utility, and open space networks. The variant would not change any aspect of the Proposed Project related to demolition; the construction of shoreline improvements; geotechnical stabilization; the construction of the transportation, open space, and utility infrastructure networks; or other improvements such as the construction of the new 20th Street pump station; however, the volume of excavated soils would be reduced and changes to site grading would result in slightly higher base elevations and slope gradients. Proposed development is expected to involve up to five phases (Phases 1 through 5) and is conceptual; however, construction is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. As with the Proposed Project, the multi-phased approach to project site development would result in project site occupancy and operations overlapping with, and being affected by, future construction phases.

Proposed Land Use Programs

The Reduced Off-Haul Variant does not include any changes to the land use programs for the Maximum Residential Scenario or the Maximum Commercial Scenario defined for the Proposed Project or changes to the proposed open space network, traffic and circulation plan, new infrastructure and utility plans, geotechnical stabilization plan, or the shoreline improvement plan described in Chapter 2, Project Description. The land use program and project site improvements would be implemented in a similar fashion as that for the Proposed Project according to the timeline defined in the phasing plan for the Proposed Project.

Impact Evaluation

APPROACH TO ANALYSIS

The Reduced Off-Haul Variant to the Proposed Project does not involve any change to the mix of land uses, the space allocation of uses, or the residential unit count under the Maximum Residential and Maximum Commercial Scenarios of the Proposed Project. Likewise, this variant does not involve any change to the locations, configurations, or building envelopes of the programmed development under the two scenarios analyzed for the Proposed Project. Therefore, physical environmental effects under this variant would be substantially the same as those identified for the Proposed Project for the following environmental topics: Land Use and Land Use Planning, Population and Housing, Recreation, Utilities and Service Systems, Public Services, Mineral and Energy Resources, and Agricultural and Forest Resources. All mitigation and improvement measures described for these topics under the Proposed Project would be applicable to this variant.

The following environmental topics are analyzed for this variant: Cultural Resources (Archaeological Resources and Historic Architectural Resources), Transportation and Circulation, Noise and Vibration, Air Quality, Greenhouse Gas Emissions, Wind and Shadow, Biological Resources, Geology and Soils, Hydrology and Water Quality, and Hazards and Hazardous Materials.

CULTURAL RESOURCES

Archeological Resources, Human Remains, and Tribal Cultural Resources

Under the Reduced Off-Haul Variant, the depth and extent of excavation would be reduced and/or modified through the elimination of the below-grade basement levels on Parcels E1 through E4, H1, and H2; the elimination of the eastern portion of one of the two below-grade basement levels on Parcel C1; and the limited expansion of the proposed 15-foot-deep below-grade basement level on Parcel D. As with the Proposed Project, excavated soils would be

analyzed prior to off-hauling to determine the volume that could be reused on the project site. Excavated soils and clean imported fill would be used to increase the base elevation on the southeast portion of the 28-Acre Site, which would be higher than that for the Proposed Project.

The project site has been extensively altered over time, resulting in low potential for prehistoric archeological resources. As further described, historic archeological resources such as subsurface architectural features related to the Union Iron Works (UIW) Historic District, landscape features evidencing historic land uses, infrastructure features related to the former Union Iron Works/Bethlehem Steel industrial complex and associated industrial activities, refuse features related to Irish Hill habitation and industrial occupancies, and industrial features related to the various industries that have occupied the project site may be present on the project site. Although the potential for the discovery of historic archeological resources exists, the site history suggests that the rapid large-scale expansion of this area in response to the needs of World Wars I and II constituted a series of actions more likely to have damaged or destroyed valuable archaeological resources, than to have left behind any new significant resources. However, as discussed under Impacts CR-1 and CR-2 for the Proposed Project on pp. 4.D.24-4.D.31, the potential for encountering subsurface archeological resources, including human remains, cannot be conclusively ruled out, especially in those circumstances where excavation and grading would occur in previously undisturbed soils. Thus, as with the Proposed Project, with implementation of Mitigation Measures M-CR-1a: Archaeological Testing, Monitoring, Data Recovery and Reporting and M-CR-1b: Interpretation, pp. 4.D.25-4.D.29, the Reduced Off-Haul Variant would not cause a substantial adverse change to the significance of an archaeological resource, if present within the project site.

The impacts of the Reduced Off-Haul Variant on tribal cultural resources would be substantially the same as those for the Proposed Project, i.e., less than significant (see Impact CR-3 on p. 4.D.31).

Therefore, the project-level and cumulative archeological and tribal cultural resources impacts under the Reduced Off-Haul Variant would be the same as, or similar to, those discussed for the Proposed Project under Impacts CR-1 through CR-3 and Impact C-CR-1 in Section 4.D, Cultural Resources. Thus, as with the Proposed Project, with implementation of Mitigation Measures M-CR-1a and M-CR-1b, the project-level and cumulative impacts of the Reduced Off-Haul Variant would be reduced so as not to cause a substantial adverse change to archeological and tribal cultural resources.

Historic Architectural Resources

The project site contains 11 contributors to the UIW Historic District (see Table 4.D.1: Contributing UIW Historic District Features on the Project Site, p. 4.D.35). The Reduced Off-

Haul Variant (including the three options for stormwater/wastewater management and treatment and two of the three options for grading around Building 12) would not include any changes to the Maximum Residential Scenario or the Maximum Commercial Scenario defined for the Proposed Project; or the plans for the preservation/rehabilitation/relocation of Buildings 2, 12, and 21; the demolition of Buildings 11, 15, 16, 19, 25, 32, and 66; the removal of the northern spur of the remnant of Irish Hill for construction of the new 21st Street; the transportation and open space network; the utility infrastructure; the public realm improvements; or the design principles identified in the *Pier 70 SUD Design for Development*.

Under the Reduced Off-Haul Variant, as with the Proposed Project, the project site's base elevation would be raised for the purposes of sea-level rise protection. However, under this variant there would be a 2- to 8-foot addition to the proposed 5-foot increase to the base elevation of the southeastern portion of the 28-Acre Site identified for the Proposed Project. As with the Proposed Project, the generally flat and developed appearance of the UIW Historic District would not be perceptibly altered by the range of increases to the project site's base elevation under this variant and the resultant slope gradient changes. Thus, as with the Proposed Project, the impact of the Reduced Off-Haul Variant's preliminary site grading plan on the integrity of setting for the UIW Historic District would be less than significant with mitigation.

As stated above, only two of the three grading options identified under the Proposed Project would be applicable to the Reduced Off-Haul Variant. Grading Option 1 would not be applicable under this variant because of the roughly 5- to 8-foot increase to the exterior grade around Building 12 (especially on its eastern and southern elevations along new Maryland and new 22nd streets, respectively). Grading Option 2: Raise the Interior Slab on Grade of Building 12 Structural Frame and Raise the Exterior Grade, and Grading Option 3: Raise Building 12 Structural Frame would remain applicable because these options include changes to the elevation of Building 12's interior slab and its structural frame. Under this variant, the maximum changes to the base elevations immediately surrounding Buildings 2, 12, and 21 would be approximately 2 feet, approximately 8 feet, and approximately 5 feet, respectively. Therefore the height of the retained historic structures under this variant (and their relationships to other resources and the UIW Historic District as a whole) would not be substantially different from those under the Proposed Project (including Grading Options 2 and 3), and would not constitute a material change to the integrity of the individual resource's physical setting. Under the Reduced Off-Haul Variant, as with the Proposed Project, the proposed changes to Buildings 2, 12, and 21 would adhere to the Secretary of the Interior's Standards, ensuring that the majority of the character-defining features of the individual resources would be retained. Thus, as with the Proposed Project, the minor change to the relationship of rehabilitated (Buildings 2 and 12), relocated (Building 21), and new infill structures to each other, to the project site's transportation and open space network, and to the overall environmental setting including the UIW Historic District as a

result of an incremental raising of the project site's base elevation under the Reduced Off-Haul Variant would have a less-than-significant impact on the integrity of setting at any of the rehabilitated or relocated contributing resources. In addition, the land use program for the Proposed Project and the variant would be similar; thus, as with the Proposed Project, the impacts associated with the demolition of historic resources and the construction of new buildings within and adjacent to the existing UIW Historic District and the remnant of Irish Hill would be less than significant, as with the Proposed Project.

Therefore, the project-level and cumulative historic architectural resource impacts under the Reduced Off-Haul Variant would be the same as, or similar to, those discussed for the Proposed Project under Impacts CR-4 through CR-12 and Impact C-CR-2 in Section 4.D, Cultural Resources. As with the Proposed Project, with implementation of Improvement Measures I-CR-4a: Documentation and I-CR-4b: Public Interpretation, on pp. 4.D.91-4.D.92, the less-than-significant impact related to the proposed demolition of seven contributing features would be reduced. Furthermore, as with the Proposed Project, with implementation of Mitigation Measures M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria and M-CR-11: Performance Criteria and Review Process for New Construction, on pp. 4.D.93-4.D.94 and pp. 4.D.103-4.D.106, the project-level and cumulative impacts of the relocation and rehabilitation of contributing features would be reduced so as not to cause a substantial adverse change to historic architectural resources.

Based on the above, project-level and cumulative cultural resource impacts under the Reduced Off-Haul Variant would be similar to those identified under the Proposed Project (see Section 4.D, Cultural Resources). Implementation of the Reduced Off-Haul Variant would not change the analysis or conclusions in that section, would not result in new or more severe impacts, and no new mitigation measures would be required.

TRANSPORTATION AND CIRCULATION

Demolition, excavation, site grading, and construction activities under the Reduced Off-Haul Variant would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. Under this variant (even with consideration for the slight increase in the amount of imported clean fill than that for the Proposed Project) there would be slightly fewer construction truck traffic trips due to the reduction in the volume of excavated soils that would need to be transported off site for disposal or reuse. As discussed under Impact TR-1 for the Proposed Project, this variant would also use the same construction truck traffic routes (e.g., Third Street and either 25th or Mariposa streets to access I-280 to travel south; Third Street and either Second or Fifth streets to reach the Bay Bridge and the East Bay; and Third Street, Howard Street, and Van Ness Avenue [U.S. 101] to travel to North Bay destinations). The temporary (and less than significant) impacts associated with construction-related traffic of the Proposed Project

are described under Impact TR-1, and that impact analysis would be applicable to this variant because construction truck traffic would be substantially the same as, or less than that, for the Proposed Project and would not lead to a different conclusion.

The Reduced Off-Haul Variant would not result in any increases in operational VMT because it is a construction-related variant and does not alter the development scenarios for the Proposed Project. Since the Reduced Off-Haul Variant would not change any of the operational aspects of the Proposed Project there would be no change to traffic, transit, pedestrian, bicycle, loading, or emergency access. This variant would not change any of the circulation patterns on the project site. Therefore, operational-related project-level transportation and circulation impacts under the Reduced Off-Haul Variant would be substantially the same as those discussed for the Proposed Project. Thus, all operational-related mitigation measures identified for the Proposed Project would be applicable to the Reduced Off-Haul Variant (i.e., Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed [pp. 4.E.91 to 4.E.93] under Impact TR-5; Mitigation Measure M-TR-10: Improve pedestrian facilities on Illinois Street adjacent to and leading to the project site [pp. 4.E.99-4.E.100] under Impact TR-10; Mitigation Measure M-TR-12a: The Project's Transportation Coordinator should coordinate with building tenants and delivery services to minimize deliveries during a.m. and p.m. peak periods under Impact TR-12; Mitigation Measure M-TR-12B: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed [p. 4.E.105] under Impact TR-12; Mitigation Measure M-C-TR-4a-: Increase capacity on the 48 Quintara/24th Street bus route under the Maximum Residential Scenario [p. 4.E.118] under Impact C-TR-4; and Mitigation Measure M-C-TR-4b: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario [p. 4.E.118] under Impact C-TR-4). The proposed modifications to the below-grade parking program under this variant would not result in any changes to the overall parking program. Parking spaces that would not be available under this variant would be provided in building podiums and as part of a structured parking program on Parcels C1 and C2 (if implemented).

Based on the above, project-level and cumulative transportation and circulation impacts under the Reduced Off-Haul Variant would be similar to those identified under the Proposed Project (see Section 4.E, Transportation and Circulation). Implementation of the Reduced Off-Haul Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

NOISE AND VIBRATION

Under the Reduced Off-Haul Variant, construction-related noise and vibration would be generated by the same types of construction equipment as the Proposed Project. Under this variant, demolition, excavation, site grading, and construction activities would be conducted

according to the same construction phases (Phases 1 through 5) as under the Proposed Project. As discussed under Impact NO-1, on-site construction equipment would be operated in accordance with Article 29 of the San Francisco Police Code (Noise Ordinance). As discussed under Impact NO-2, the multi-phased approach to project site development would result in the exposure of sensitive receptors (e.g., the residential land uses on the Illinois Parcels – Parcels HDY1, HDY2, PKN, and PKS) to noise from active construction phase(s) and operational noise associated with the occupancy and operation of previously completed phases. As discussed under Impact NO-3, the noise and vibration that would be generated during the excavation and construction of the proposed on-site structures would include groundborne noise and surface vibrations from pile-driving for foundations and potentially construction of structural wall solutions. Further, construction-related traffic increases from all new development on the project site would use the same roads (20th, new 21st, and new 22nd streets) to access the project site from Illinois Street, exposing the same sensitive receptors (those facing these streets on Parcels C2, F, G, HDY, PKN, and PKS) to construction traffic noise increases (over the 11 years of construction).

Due to the more limited excavation plan, the decrease in the number of material deliveries since fewer basement levels would be constructed, and the decrease in the number of construction truck trips with the reduction in the volume of earth movement under this variant (even with consideration for the slight increase in the amount of clean fill that would be imported to the project site), the increase in ambient noise levels during the various construction phases would be expected to be incrementally less than that which would be generated under the Proposed Project. Although construction-related noise under the Reduced Off-Haul Variant would decrease, the decrease would be minimal in relation to the noise generated by the overall amount of construction and the overall number of construction truck trips estimated for the Proposed Project. Thus, the construction noise impacts related to the use of construction equipment under this variant would be less than significant with mitigation, similar to those for the Proposed Project; and the construction-related mitigation measure identified for the Proposed Project would be applicable to the Reduced Off-Haul Variant (i.e., Mitigation Measure M-NO-1: Construction Noise Control Plan on pp. 4.F.33-4.F.35). As with the Proposed Project, the finding of a significant and unavoidable construction-related impact on existing and future on- and off-site sensitive receptors under this variant would be associated with the potential for pile driving; thus, as with the Proposed Project, Mitigation Measure M-NO-2: Noise Control Measures During Pile Driving (see pp. 4.F.40-4.F.41) would also be applicable to the Reduced Off-Haul Variant. Although construction-related groundborne vibration under this variant could decrease due to the more limited excavation plan, the decrease would be slight in relation to the overall development program and the site stabilization plan. Thus, the construction-related mitigation measure identified for the Proposed Project would also be applicable to the Reduced Off-Haul Variant (i.e., Mitigation Measure M-NO-3: Vibration Control Measures During Construction on pp. 4.F.44-4.F.45).

As noted above, the Reduced Off-Haul Variant would not include any changes to the Maximum Residential or Maximum Commercial Scenarios. Thus, under the Reduced Off-Haul Variant, as with the Proposed Project, operational-related noise impacts related to stationary equipment and special events would remain less-than significant with mitigation (Impact NO-4 on pp.4.F.45-4.F.51 and Impact NO-7). As with the Proposed Project, operational-related noise impacts related to traffic noise would remain significant and unavoidable even with implementation of mitigation measures identified for the Proposed Project (see Impact NO-5). And finally, as with the Proposed Project, noise related to operations-related groundborne noise and vibration under this variant would be less than significant (see discussion under Impact NO-8 on pp. 4.F.76-4.F.77). All operational-related mitigation measures identified for the Proposed Project (i.e., Mitigation Measures M-NO-4a: Stationary Equipment Noise Controls and M-NO-4b: Design of Future Noise-Generating Uses near Residential Uses on pp. 4.F.50-4.F.51; Mitigation Measure M-AQ-1g: Transportation Demand Management, in Section 4.G, Air Quality, on p. 4.G.50; Mitigation Measure M-NO-6: Design of Future Noise-Sensitive Uses on pp. 4.F.70-4.F.71; and Mitigation Measure M-NO-7: Noise Control Plan for Special Outdoor Amplified Sound, p. 4.F.73) would therefore be applicable to the Reduced Off-Haul Variant.

Based on the above, project-level and cumulative noise and vibration impacts under the Reduced Off-Haul Variant would be similar to, or slightly less than, those identified under the Proposed Project (see Section 4.F, Noise and Vibration). Implementation of the Reduced Off-Haul Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

AIR QUALITY

Under the Reduced Off-Haul Variant, construction-related air quality emissions would be generated by the same type of construction equipment as the Proposed Project. Under this variant demolition, excavation, site grading, and construction activities would be conducted according to the Proposed Project's construction phases (Phases 1 through 5). As with the Proposed Project, the multi-phased approach to project site development would result in simultaneous emissions from active construction phase(s) and the occupancy and operation of previously completed phases. As described above, the excavation activities under the Reduced Off-Haul Variant would be more limited than under the Proposed Project. As with the Proposed Project, implementation of dust control measures in compliance with the regulations and procedures set forth by the San Francisco Dust Control Ordinance would be required.

Due to the more limited excavation plan (and associated reduction in the amount of building construction) and the decrease in the number of construction truck trips with the reduction in the volume of earth movement under this variant, the contribution of on-road construction truck trips to the increase in the emissions of criteria air pollutants during the various construction phases

would be expected to be less than that generated under the Proposed Project. The reduction in on-road haul trips under the Reduced Off-Haul Variant would result in emission reductions of approximately 0.07 tons per year (tpy) of reactive organic gases (ROG), approximately 0.75 tpy of nitrous oxides (NOx), and a negligible amount (less than 0.01 tpy) of particulate matter and fine particulate matter (PM_{10} and $PM_{2.5}$) for Phases 2 through 5.[4] The resulting reductions in annual emissions are as follows:

- Maximum annual ROG emissions from the Proposed Project (approximately 4.6 tpy for Phase 2 of the Maximum Residential Scenario) – reduced to approximately 4.5 tpy;
- Maximum annual NOx emissions from the Proposed Project (approximately 8.2 tpy for Phase 2 of the Maximum Residential Scenario) – reduced to approximately 7.4 tpy;
- Maximum annual PM_{10} emissions from the Proposed Project (approximately 0.34 tpy for Phase 2 of the Maximum Residential Scenario) – reduced to approximately 0.33 tpy; and
- Maximum annual $PM_{2.5}$ emissions from the Proposed Project (approximately 0.32 tpy for Phase 2 of the Maximum Residential Scenario) – reduced to approximately 0.31 tpy.

Although construction-related emissions of criteria air pollutants under the Reduced Off-Haul Variant would decrease, the decrease would be slight in relation to the projected emissions from the overall amount of construction and the overall number of construction truck trips estimated for the Proposed Project (see Table 4.G.6: Unmitigated Average Daily and Maximum Annual Emissions for the Maximum Residential Scenario During Construction, in Section 4.G, Air Quality, pp. 4.G.36-4.G.37, for the average daily and maximum annual emissions for the unmitigated Maximum Residential Scenario, and Table 4.G.8: Mitigated Average Daily and Maximum Annual Emissions for the Maximum Residential Scenario During Construction, pp. 4.G.54-4.G.55, for the mitigated scenario). Thus, the construction-related air quality impacts under this variant would be substantially the same as, or incrementally less than, those from the Proposed Project. As noted above the Reduced Off-Haul Variant would not include any changes to the Maximum Residential or Maximum Commercial Scenarios defined for the Proposed Project, and emissions associated with the occupancy and operation of the completed development Phases under this variant would be the same as those from the Proposed Project.

Thus, under the Reduced Off-Haul Variant, as with the Proposed Project, construction-related emissions during the concurrent construction of Phases 1 and 2 would be less than significant. However, the combined emissions from Phase 3 construction and the occupancy and operation of Phases 1 and 2; from Phase 4 construction and the occupancy and operation of Phases 1 through 3; and from Phase 5 construction and the occupancy and operation of Phases 1 through 4 would exceed the significance thresholds for certain criteria air pollutants. Therefore, under this variant, as with the Proposed Project, the combined criteria pollutant emissions generated during a

[4] Environmental Science Associates, Reduced Off-Haul Variant Calculations, July 20, 2016.

construction phase and the occupancy and operation of a previously completed phase(s) would result in significant and unavoidable air quality impacts and the construction- and operational-related mitigation measures identified for the Proposed Project would be applicable to the Reduced Off-Haul Variant.

Under the Reduced Off-Haul Variant, as with the Proposed Project, toxic air contaminant (TAC) emissions from construction activities and, to a much lesser degree, project operations, would expose on- and off-site sensitive receptors to increased TAC emissions and $PM_{2.5}$ concentrations, the former of which would be significant without mitigation (for on-site sensitive receptors only). As discussed under Impact AQ-3 for the Proposed Project, the exposure of on- and off-site sensitive receptors to increased TAC emissions from construction equipment as well as stationary sources (e.g., diesel back-up generators) would be reduced to a less-than-significant level with implementation of Mitigation Measures M-AQ-1a: Construction Emissions Minimization, M-AQ-1b: Diesel Backup Generator Specifications, M-AQ-1c: Use Low- and Super-Compliant VOC Architectural Coatings in Maintaining Buildings through CC&Rs, and M-AQ-1f: Transportation Demand Management. These mitigation measures would be applicable to the Reduced Off-Haul Variant.

As with the Proposed Project, the Reduced Off-Haul Variant would be consistent with the 2010 Clean Air Plan, and impacts would be less than significant with implementation of the Transportation Demand Management Plan (TDM) (see "TDM Plan," in Section 4.E, Transportation and Circulation, pp. 4.E.46-4.E.47), which includes strategies to discourage the use of automobiles and encourage transit and other modes of transportation. Other mitigation measures of the Proposed Project, identified under Impact AQ-1, that would also be applicable to the Reduced Off-Haul Variant in relation to being consistent with the 2010 Clean Air Plan are as follows:

- Mitigation Measure M-AQ-1a : Construction Emissions Minimization Plan (requiring low NOx emitting construction vehicles; requiring Tier 4, low-emissions construction vehicles),
- Mitigation Measure M-AQ-1b: Diesel Backup Generator Specifications (reducing NOx associated with operation)
- Mitigation Measure M-AQ-1f: Transportation Demand Management
- Mitigation Measure M-AQ-1g: Additional Mobile Source Control Measures (preferential parking and/or charging stations for fuel-efficient vehicles and a neighborhood electric vehicle program), and
- Mitigation Measure M-AQ-1h: Emissions Offset of Operational Emissions (implement replacement or repair of high-emitting vehicles).

Thus, as with the Proposed Project, the implementation of the TDM strategies and mitigation measures would ensure the project includes relevant transportation control measures specified in

the 2010 Clean Air Plan (see Impact AQ-4). The TDM Plan and mitigation measures would be applicable to the Reduced Off-Haul Variant ensuring that implementation of the Reduced Off-Haul Variant would also be less-than significant with mitigation.

As with the Proposed Project, the impacts of the Reduced Off-Haul Variant in terms of its creation of objectionable odors that would affect a substantial number of people (see Impact AQ-5) would be less than significant.

Based on the above, project-level and cumulative air quality impacts under the Reduced Off-Haul Variant would be similar to, or slightly less than, those identified under the Proposed Project (see Section 4.G, Air Quality). Implementation of the Reduced Off-Haul Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

GREENHOUSE GAS EMISSIONS

A variety of controls are in place to ensure that development in San Francisco would not impair the State's ability to meet Statewide greenhouse gas (GHG) reduction targets outlined in AB 32, nor impact the City's ability to meet San Francisco's local GHG reduction targets. Projects that are consistent with San Francisco's GHG Reduction Strategy would not contribute significantly to global climate change. Similar to the Proposed Project, the Reduced Off-Haul Variant would be required to comply with these regulations and requirements that reduce GHG emissions (see Table 4.H.2: Regulations Applicable to the Proposed Project in Section 4.H, Greenhouse Gas Emissions, starting on p. 4.H.13). Since the Reduced Off-Haul Variant would comply with GHG reduction measures required in various City ordinances and would be consistent with all the regulations applicable to the Proposed Project, it would comply with San Francisco's Greenhouse Gas Reduction Strategy. Therefore, as with the Proposed Project, the Reduced Off-Haul Variant would have a less than cumulatively considerable contribution to significant cumulative GHG impacts.

Implementation of the Reduced Off-Haul Variant would result in fewer construction truck trips than the Proposed Project because of the reduction in the overall earth movement under this variant. Thus construction activities under this variant that would result in GHG emissions would not be as intensive as those for the Proposed Project.

The Reduced Off-Haul Variant would not alter the GHG emissions associated with operation of the Proposed Project because this variant would not change the two land use scenarios defined for the Proposed Project. As with the Proposed Project, this variant would introduce a mixed-use development in an area that is served by public transit, and would include Class I and Class II bicycle parking spaces, energy efficiency features beyond Title 24 requirements, low-impact

stormwater management design, water-efficient landscaping, water-conserving interior design, convenient recycling and composting, street trees, and other features consistent with San Francisco's ordinances and requirements. Similar to the Proposed Project, development would be consistent with the Sustainable Communities Strategy by including residential and commercial uses in a designated Priority Development Area per Plan Bay Area, furthering the region's goals for reducing GHG emissions. Implementation of local GHG reduction requirements would substantially reduce a project's GHG emissions. In addition, as described in Section 4.H, Greenhouse Gas Emission, implementation of air quality mitigation measures would also have the added benefit of further reducing GHG emissions from the Proposed Project. Mitigation Measures M-AQ-1a through M-AQ-1h, shown in Section 4.G, Air Quality, pp. 4.G.42-4.G.51, would help reduce emissions of GHGs through the reduction in construction emissions; limitations on diesel generators; use of low VOC architectural coatings and green consumer products; electrification of loading docks; encouragement of the use of transit and non-motorized modes of transportation; and emission offsets. These mitigation measures would also be applicable to the Reduced Off-Haul Variant and would further reduce the variant's less-than-significant GHG emissions.

Based on the above, GHG impacts under the Reduced Off-Haul Variant would be similar to, or slightly less than, those identified under the Proposed Project (see Section 4.H, Greenhouse Gas Emissions). Implementation of the Reduced Off-Haul Variant would not result in new or substantially more severe impacts and would not change the analysis or conclusions in that section.

WIND AND SHADOW

Wind

As described in Section 4.I, Wind and Shadow, the wind tunnel study prepared for the Proposed Project assumed full build-out of building volumes to the maximum zoned height (per Figure 2.13: Proposed Height Limits Plan, in Chapter 2, Project Description, p. 2.40) and cover the entire footprint of each parcel. For residential parcels, representative residential building typologies were modeled, while maximum envelope massings were used for commercial parcels. The area around Building 12 was modeled as flat (Grading Option 3, where the grade matches surrounding grades). However, the wind tunnel study did not account for the proposed increase to the project site's base elevation because proposed changes in grade were deemed insufficient to affect pedestrian-level wind speeds.

Maximum building heights relative to the surrounding grade under this variant would remain the same as under the Proposed Project. However, under this variant the base elevation on Parcels C2 and H2 would increase by approximately 2 feet, the base elevation on Parcel H1

would increase by approximately 4 feet, the base elevation on Parcel G would increase by approximately 6 feet; and the base elevation on Parcel F would increase by approximately 8 feet. The maximum base elevation on the other parcels would not change from those under the Proposed Project. The increased site grade elevation under the Reduced Off-Haul Variant would be in addition to the 5-foot increase to the project site's base elevation identified for the Proposed Project. The incremental change to the maximum building base elevation on Parcels C2, F, G, H1, and H2 would not be substantial enough to meaningfully alter the pedestrian level wind speeds or the wind speeds at the public rooftop open spaces identified for the Proposed Project. Under this variant, as with the Proposed Project, project-level and cumulative wind impacts on public areas at full build-out would be less than significant (see discussion under Impact WS-3).

Although project-level and cumulative wind impacts at full build-out would be less than significant, phased development under the Proposed Project or Reduced Off-Haul Variant could result in the temporary but substantial alteration of pedestrian level winds in and around public areas (see discussion under Impact WS-1). Furthermore, under this variant, as with the Proposed Project, wind speeds on rooftop public open spaces on Parcels C1 and C2 would also be substantially altered (see discussions under Impact WS-2). As stated above, the incremental change to the maximum building base elevations under this variant would not be substantial; therefore, the temporary wind impacts on public areas during phased development and the potential for wind hazards on public rooftop open spaces under the Reduced Off-Haul Variant would be the similar to those discussed for the Proposed Project, i.e., less than significant with mitigation. Thus, the mitigation and improvement measures identified for the Proposed Project would be applicable to the Reduced Off-Haul Variant.

Shadow

As described in Section 4.I, Wind and Shadow, the shadow study prepared for the Proposed Project assumed full build-out under the height plan shown in Figure 2.13: Proposed Height Limits Plan, in Chapter 2, Project Description, p. 2.40; assumed building volumes that are built to the maximum height and cover the entire footprint of each parcel; assumed an additional 16 feet of height above the maximum height for each parcel to account for rooftop mechanical features; and accounted for the proposed increase to the project site's base elevation and the worst-case site-specific grading plan for Building 12 (Option 3).

Maximum building heights relative to the surrounding grade under this option would remain the same as under the Proposed Project. However, under the Reduced Off-Haul Variant the base elevation of the southwestern portion of the 28-Acre Site would be increased by approximately 2 to 8 feet (depending on location), which would be in addition to the 5-foot increase to the project site's base elevation identified for the Proposed Project. Under this variant the base elevation on Parcels C2 and H2 would increase by approximately 2 feet, the base elevation on

Parcel H1 would increase by approximately 4 feet, the base elevation on Parcel G would increase by approximately 6 feet; and the base elevation on Parcel F would increase by approximately 8 feet. No other elevation changes would be introduced under this variant.

This variant would have the potential to add an increment of net new shadow (over that of the Proposed Project) on planned parks and open spaces on the project site (which are included here for informational purposes only), existing and/or planned parks and open space in the project site vicinity, and future parks and open spaces. The additional shadow would be offset somewhat by a corresponding higher base elevation for the proposed open spaces on the project site under this variant. The incremental change to the maximum base elevation on these parcels would not be substantial enough to create net new shadow that could alter the usability of the existing and proposed parks, open spaces, and recreation areas. Therefore, project-level and cumulative shadow impacts under the Reduced Off-Haul Variant would be the similar to those discussed for the Proposed Project (see Section 4.I, Wind and Shadow).

Based on the above, project-level and cumulative wind and shadow impacts under the Reduced Off-Haul Variant would be similar to those identified under the Proposed Project (see Section 4.I, Wind and Shadow). Implementation of the Reduced Off-Haul Variant would not change the analysis or conclusions in that section, would not result in new or more severe impacts, and no new mitigation measures would be required.

BIOLOGICAL RESOURCES

Under the Reduced Off-Haul Variant the depth and extent of excavation on Parcels C1, D, E1 through E4, H1, and H2 would be modified; the base elevation of the southwestern portion of the 28-Acre Site would be raised; a new north-south retaining wall would be constructed along the base of the remnant Irish Hill between new 21st and 22nd streets; and the proposed retaining wall along the north side of 22nd Street adjacent to Parcel C2 would be truncated. Thus, ground disturbance related to demolition, excavation, site preparation and grading, geotechnical stabilization, and the emplacement of new infrastructure systems within the existing and new public rights-of-way under this variant would not be as great as that for the Proposed Project. The Reduced Off-Haul Variant would not change any other aspect of the Proposed Project as it relates to the construction of shoreline improvements, geotechnical stabilization (i.e., installation of structural wall solutions on the bayside of Parcels B and H2); the construction of the transportation, open space, and utility infrastructure networks; and other site improvements.

As with the Proposed Project, noise, vibratory, and visual disturbance related to demolition, excavation, site grading, and other construction-related activities of the Reduced Off-Haul Variant would have the potential to affect terrestrial and marine biological resources. As with the Proposed Project, construction activities could disrupt birds attempting to nest in the vicinity of

the project site, disrupt parental foraging activity, or displace mated pairs with territories in the project vicinity; could disrupt local, common, or special-status bats that may roost in vacant buildings or existing trees on the project site; and could disrupt or interfere with wildlife movement, wildlife corridors, or wildlife nursery sites (See the separate discussions under Impacts BI-1, BI-2, and BI-5). Under the Reduced Off-Haul Variant there would be a reduction in the number of construction truck traffic trips due to the reduction in the volume of excavated soils; however, any noise reductions associated with the more limited excavation plan and the reduction in truck traffic trips would represent a minor reduction in the degree of the impact of the Proposed Project. The noise, vibratory, and visual disturbance reductions under this variant would not be substantial; thus, as with the Proposed Project, the impacts of the Reduced Off-Haul Variant on nesting birds would continue to require mitigation. Furthermore, since there would be no change to the Proposed Project's demolition or building preservation / rehabilitation plan under this variant, the impacts on local, common, or special-status bats would require mitigation. Therefore, the mitigation measures identified for the Proposed Project would be applicable to this variant. The implementation of these mitigation measures under this variant, as with the Proposed Project, would also address the effect of construction-related activities on wildlife movement, wildlife corridors, and wildlife nursery sites. Under the Reduced Off-Haul Variant, the introduction of new tall structures on the project site, which is located within the Pacific Flyway, would have the same potential to affect migratory birds; however, as with the Proposed Project, adherence to the City's Standards for Bird-Safe Buildings would ensure that this impact would be less than significant.

The Reduced Off-Haul Variant does not propose any changes to the construction of the shoreline improvements, geotechnical stabilization strategies, or other in-water construction activities. Thus, impacts on special-status marine species would be similar to those under the Proposed Project. As with the Proposed Project, best management practices (BMP) that would be implemented as part of San Francisco, San Francisco Bay Conservation and Development Commission (BCDC), and State Water Quality Control Board permit requirements as well as BMPs that would be implemented as part of the Erosion and Sediment Control Plan and Stormwater Pollution Prevention Plan (SWPPP) required under the National Pollution Discharge Elimination System (NPDES) Permit and Construction General Stormwater Permit would be applicable to the Reduced Off-Haul Variant. As described under Impact BI-3, implementation of these BMPs would protect water quality by limiting the potential for accidental discharges of polluted runoff, sediment, construction debris, etc. from entering San Francisco Bay waters. Thus, as with the Proposed Project, adherence to the BMPs identified in the local, State, and Federal permit requirements would ensure that impacts of the Reduced Off-Haul Variant on special-status marine species would be less than significant. Furthermore, under this variant, as with the Proposed Project, underwater construction activities related to the reconstruction of the steel sheet pile bulkhead in Reach II and repair and improvement of shoreline protective riprap

would have a less-than-significant impact on the temporary loss of the sessile marine invertebrate community currently present, loss of a small area of soft substrate intertidal habitat in Reach I and associated marine communities, and potential temporary disturbance to soft and hard substrate habitat and associated marine communities.

Under the Reduced Off-Haul Variant, as with the Proposed Project, underwater noise that would be generated as a result of the use of vibratory or impact pile-driving hammers during installation of the steel sheet pile or H-piling soldier wall for the repair of Shoreline Reach II bulkhead could have a significant impact on special-status aquatic species and marine mammals. Thus, the mitigation measure identified for the Proposed Project would be applicable to this variant. The implementation of Mitigation Measure M-BI-3: Pile Driving Noise Reduction for Protection of Fish and Marine Mammals under the Reduced Off-Haul Variant would address the effect of construction-related underwater noise on fish and marine mammals. Furthermore, under this variant, as with the Proposed Project, adherence to State and Federal regulatory permit requirements for project activities resulting in the discharge of San Francisco Bay fill or other disturbance to jurisdictional waters (i.e., below the high tide line, below the mean high water mark, and in areas subject to tidal action as well as being within the 100-foot-wide shoreline band) would require the development of a SWPPP to ensure that the potential for direct and indirect water quality degradation would be minimized, and the implementation of compensatory mitigation to offset the permanent placement of new fill resulting in the loss of jurisdictional waters. Thus, Mitigation Measure M-BI-4: Compensation for Fill of Jurisdictional Waters identified for the Proposed Project would be applicable to the Reduced Off-Haul Variant. And finally, as with the Proposed Project, the Reduced Off-Haul Variant would not conflict with local policies or ordinances protecting biological resources, e.g., the removal of a landmark tree, or conflict with adopted habitat conservation plan or natural community conservation plan since none exist on the project site.

Based on the above, project-level and cumulative biological resource impacts under the Reduced Off-Haul Variant would be similar to those identified under the Proposed Project (see Section 4.M, Biological Resources). Implementation of the Reduced Off-Haul Variant would not change the analysis or conclusions in that section, would not result in new or more severe impacts, and no new mitigation measures would be required.

GEOLOGY AND SOILS

The Reduced Off-Haul Variant would not change the aspects of the Proposed Project related to the construction of shoreline improvements, geotechnical stabilization (i.e., installation of structural wall solutions on the bayside of Parcels B and H2); the construction of the transportation, open space, and utility infrastructure networks; or other site improvements. Under the Reduced Off-Haul Variant the depth and extent of excavation on Parcels D, C1, E1 through

E4, H1, and H2 would be modified; the base elevation of the southwestern portion of the 28-Acre Site would be raised; a new north-south retaining wall would be constructed along the base of the remnant Irish Hill between new 21st and 22nd streets; and the proposed retaining wall along the north side of 22nd Street adjacent to Parcel C2 would be truncated. Thus, ground disturbance related to demolition, excavation, and site preparation and grading would not be as great as that for the Proposed Project.

Under the Reduced Off-Haul Variant, the project site would be subjected to the same seismic hazards as would occur under the Proposed Project, including groundshaking, liquefaction, and lateral spreading (see Impact GE-1). As for the Proposed Project, construction of the proposed structures in compliance with the San Francisco and Port of San Francisco Building Codes would alleviate the effects of groundshaking under this variant.

Under this variant, each of the proposed new structures on Parcels E1 through E4, H1, and H2 would not include 15-foot-deep below-grade basement levels; the eastern portion of the proposed structure on Parcel C1 would not include a portion of the lower of the two below-grade basement levels; and the 15-foot-deep basement level for the proposed structure on Parcel D would be expanded. The foundation systems for these structures would, therefore, be different than those for the structures that would be constructed under the Proposed Project, but the foundation systems would be designed to withstand the effects of liquefaction and seismic settlement in accordance with the recommendations of site-specific geotechnical investigations conducted for these future developments.

As for the Proposed Project, the foundation design would depend on the depth to bedrock, presence of liquefiable materials, and the individual characteristics of the building (e.g., size, height, and depth of below-grade features) and would be subject to review and approval by the Department of Building Inspection (DBI) or Port as part of the building permit approval process. Therefore, appropriate design of the building foundations in accordance with the recommendations of the site-specific geotechnical report would ensure that impacts related to liquefaction and earthquake-induced settlement would be less than significant under the Reduced Off-Haul Variant, as for the Proposed Project. This variant, as with the Proposed Project, would require the project sponsor to implement measures to control the amount of lateral displacement that could occur. As described in Section 4.N, Geology and Soils, under Impact GE-1, lateral displacement measures for the Proposed Project could include actions such as reinforcing the existing slope with a structural wall or ground improvements, including the option of installing below-grade secant pile walls along the northeastern and southeastern portions of the project site. Thus, as with the Proposed Project, measures to ensure that the effects of liquefaction and lateral spreading would be less than significant would also be implemented under this variant. See discussions under Impacts GE-1 and GE-3.

As for the Proposed Project, soil movement for foundation and basement excavation, placement of fill to raise the site grade, and construction of shoreline improvements could create the potential for wind- and water-borne soil erosion. Under the Reduced Off-Haul Variant a larger area would be graded and a greater amount of the excavated fill would be placed on or retained at the site to raise the site grade, which would result in a greater potential for soil erosion than under the Proposed Project. However, as for the Proposed Project, impacts related to soil erosion would be less than significant with implementation of an erosion and sediment control plan prepared in accordance with Article 4.2, Section 146, of the San Francisco Public Works Code and a SWPPP prepared in accordance with the State Water Resources Control Board (SWRCB) General Construction Stormwater Permit (see Impact GE-2).

Similar to the Proposed Project, implementation of San Francisco and Port of San Francisco Building Code requirements for excavation shoring and dewatering, enforced through the building permit approval process, would ensure that impacts related to unstable geologic units as a result of soil excavation and excavation dewatering would be less than significant under the Reduced Off-Haul Variant (see Impact GE-3). However, less soil excavation and excavation dewatering would be conducted under this variant in relation to the Proposed Project because each of the proposed new structures on Parcels E1 through E4, H1, H2 would not include 15-foot-deep below-grade basement levels and the eastern portion of the proposed structure on Parcel C1 would not include a portion of the lower level of the two below-grade basement levels. While this variant would include the placement of approximately 5 percent more clean fill in relation to the Proposed Project, impacts related to differential settlement would remain less than significant with measures such as proper foundation design and scheduling fill emplacement early in the construction process to facilitate settlement of the Bay Mud prior to construction of the proposed improvements.

Under the Reduced Off-Haul Variant, as with the Proposed Project, impacts on structures and future site occupants/visitors of the Illinois Parcels (Parcels HDY1, HDY2, PKN, and PKS) as a result of rock fall hazards associated with potentially unstable bedrock cuts on the remnant of Irish Hill would be significant and mitigation would be required. Therefore, the mitigation measure identified for the Proposed Project, i.e., Mitigation Measure M-GE-3a: Reduction of Rock Fall Hazards on p. 4.N.31, would be applicable to the Reduced Off-Haul Variant. Additionally, under this variant, as with the Proposed Project, hazards associated with use of the dilapidated pier extending from the project site into the San Francisco Bay by future site occupants/visitors would also be significant and mitigation would be required. Therefore, the mitigation measure identified for the Proposed Project, Mitigation Measure M-GE-3b: Signage and Restricted Access to Piers on pp. 4.N.31-4.N.32, would be applicable to the Reduced Off-Haul Variant.

The site soils are not considered expansive, but could be moderately to severely corrosive which has the potential to damage structures and utilities. Structures constructed under the Reduced Off-Haul Variant would encounter the same soils as those constructed under the Proposed Project. However, as for the Proposed Project, buried features constructed under this variant would be constructed to resist corrosion in accordance with the San Francisco and Port of San Francisco Building Codes which would ensure that impacts related to problematic soils would be less than significant (see Impact GE-4).

The 5-foot increase to the base elevation on the project site contemplated under the Proposed Project would not result in a substantial change in topography because no existing slopes would be eliminated and no new slopes would be created, as described under Impact GE-5. Under the Reduced Off-Haul Variant the 2- to 8-foot additional increase to the base elevation on the portion of the 28-Acre Site comprised of Parcels C2, E1 through E4, F, G, H1, and H2 and the adjacent public rights-of-way, e.g., new Maryland, Louisiana, 21st, and 22nd streets would change existing slopes and create new slopes. As noted, the project site has varying topography with a west-to-east trending slope to the San Francisco Bay shoreline with a change in elevation of approximately 30 feet from the western edge of the 28-Acre Site to the San Francisco Bay shoreline. Although the proposed increase to the project site's base elevation under the Reduced Off-Haul Variant would range from 7 to 13 feet and would alter the existing topography (in terms of the direction of slopes at discrete locations and the gradient) the changes would not be substantial. Further, this variant would include the same changes to the remnant of Irish Hill as would the Proposed Project. Therefore, as with the Proposed Project, impacts under the Reduced Off-Haul Variant related to alteration of topography and unique geologic or physical features of the project site would be less than significant.

As discussed under Impact GE-6, sedimentary rocks of the Franciscan Complex have produced significant fossils important for understanding the age, depositional environments, and tectonic history of San Francisco. The Franciscan Complex bedrock is close to the ground surface west of the historic shoreline, which includes Parcels C1, D, H1, and portions of Parcels E1 through E4. Under the Reduced Off-Haul Variant, less Franciscan Complex bedrock would be excavated because excavation would not occur on Parcels E1 through E4 and H1, and excavation in the eastern portion of Parcel C1 would be 12 feet shallower. While the footprint for the 15-foot-deep excavation on Parcel D would be expanded, overall the Reduced Off-Haul Variant would result in less excavation of Franciscan Complex bedrock than would occur under the Proposed Project, and would therefore have less of a potential to encounter paleontological resources. Regardless, as with the Proposed Project, mitigation identified for the Proposed Project (Mitigation Measure M-GE-6: Paleontological Resources Monitoring and Mitigation Program on pp. 4.N.33-4.N.34) would be applicable to the Reduced Off-Haul Variant. Implementation of this mitigation measure

would reduce this impact to a less-than-significant level ensuring that a substantial adverse change to the scientific significance of a paleontological resource would not occur.

Based on the above, project-level and cumulative geology and soils impacts under the Reduced Off-Haul Variant would be similar to those identified under the Proposed Project (see Section 4.N, Geology and Soils). Implementation of the Reduced Off-Haul Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

HYDROLOGY AND WATER QUALITY

Under the Reduced Off-Haul Variant the depth and extent of excavation on Parcels C1, D1, E1 through E4, H1, and H2 would generally be reduced and the base elevation of the southwestern portion of the 28-Acre Site would be raised. The Reduced Off-Haul Variant would not change aspects of the Proposed Project related to the construction of shoreline improvements; geotechnical stabilization (e.g., installation of structural wall solutions on the bayside of Parcels B and H2); the construction of the transportation, open space, and utility infrastructure networks; and other site improvements. Thus, ground disturbance related to demolition, excavation, site preparation and grading, geotechnical stabilization, and the emplacement of new infrastructure systems within the existing and new public rights-of-way under this variant would not be as great as that for the Proposed Project (including both scenarios; the combined, separate, or hybrid options for stormwater/wastewater management, and the three options for grading around Building 12).

There would be less of a potential for soil erosion and related water quality impacts under this variant because of the reduced amount of ground disturbance. As with the Proposed Project, construction-related stormwater discharges to the combined sewer system, the separate stormwater system, or directly to the San Francisco Bay under this variant would not cause water quality degradation and would not violate water quality standards or waste discharge requirements because they would be governed by Article 4.2, Section 146, of the San Francisco Public Works Code and the SWRCB Construction General Stormwater Permit, depending on the chosen sewer/wastewater management option (see discussion under Impact HY-1 for additional detail regarding the stormwater/wastewater management options and the applicability of local, State, and Federal regulatory requirements). Implementation of these regulatory requirements would ensure that water quality impacts as a result of construction-related discharges of stormwater would be less than significant.

The Reduced Off-Haul Variant includes the same in-water construction activities as the Proposed Project, including construction of shoreline improvements, repair of the existing 20th and 22nd Street combined sewer discharge (CSD) structures, and construction of a new stormwater outfall

(if a separate storm drain system is constructed). As described under Impact HY-1, these in-water construction activities would be subject to the requirements of a Section 10 or Section 404 permit from the Army Corps of Engineers that would receive water quality certification from the Regional Water Quality Control Board in accordance with Section 401 of the Clean Water Act. Furthermore, the placement of fill below the mean high water mark would be subject to a permit from the BCDC. Implementation of water quality control measures as part of compliance with the requirements of the Section 10, Section 404, and BCDC permits would ensure that the temporary water quality impacts related to in-water construction activities would be less than significant.

The magnitude of required excavation dewatering would be less under this variant because there would be less excavation for basements, but as with the Proposed Project, the discharges would be subject to Article 4.1 of the Public Works Code, as supplemented by Order No. 158170, or NPDES permit requirements, depending on whether the groundwater would be discharged to the combined sewer system or to the San Francisco Bay. Thus, under the Reduced Off-Haul Variant, as with the Proposed Project, groundwater discharges would not result in violations of a water quality standard or waste discharge requirement and water quality impacts related to the groundwater discharges would be less than significant.

Under the Reduced Off-Haul Variant, the base elevation on the interior portions of the 28-Acre Site and the low-lying portions of the Illinois Parcels would be raised higher than would occur under the Proposed Project. On and around Parcels C2 and H2 the base elevation would be about 2 feet higher, and on or around Parcel F the base elevation would be about 8 feet higher. This increase in elevation would slightly alter the existing topography in terms of the direction and degree of some slopes. However, as with the Proposed Project, compliance with Article 4.2 of the San Francisco Public Works Code, Section 147 and implementation of Stormwater Control Plans required under the Stormwater Management Requirements and Design Guidelines would ensure that stormwater runoff flow rates and volumes would either be reduced or maintained at existing levels. With this compliance, changes in the site topography would not result in changes to existing drainage patterns that would cause substantial erosion, siltation, or flooding on or off site (see Impact HY-4).

The Reduced Off-Haul Variant would include the same land uses as would occur under the Maximum Residential or Maximum Commercial Scenarios defined for the Proposed Project. The volume and rate of stormwater runoff under this variant would be the same as would occur under the Proposed Project as would the potential for littering. Under this variant, as with the Proposed Project, the combined sewer system or separate storm drain system would be designed to accommodate the 5-year storm and the public rights-of-way would be designed to accommodate and direct 100-year flood flows in excess of the 5-year storm to the San Francisco Bay in

accordance with the City's Subdivision Regulations as discussed in Impact HY-2. This and compliance with the Article 4.2, Section 147, of the San Francisco Public Works Code would ensure that stormwater flows from the project site do not exceed the capacity of the storm drain system, provide an additional source of stormwater pollutants, or violate water quality standards or waste discharge requirements. This variant would also be subject to the same regulatory requirements related to trash and litter management as would the Proposed Project. Therefore, impacts related to these topics would be less than significant, as for the Proposed Project.

Because the Reduced Off-Haul Variant would result in the same volume of wastewater and stormwater discharges as would the Proposed Project, the potential effect on the frequency of CSDs from the 20th Street sub-basin would be the same as would occur under the Proposed Project (see Impact HY-2). This variant includes the construction of a new pump station, as does the Proposed Project. However, without sufficient pumping capacity, the new pump station could cause the frequency of CSDs from the 20th Street sub-basin and/or downstream basins to increase beyond the long-term average of 10 CSD events per year, in violation of the Bayside NPDES permit and this would be a significant impact. Thus, as with the Proposed Project, operational-related mitigation measures identified for the Proposed Project would be applicable to the Reduced Off-Haul Variant.

As with the Proposed Project, the Reduced Off-Haul Variant would not result in depletion of groundwater resources because, other than the pumping of groundwater during construction dewatering, this variant would not involve the use or extraction of groundwater. Rather, as with the Proposed Project, potable water would be provided by the San Francisco Public Utilities Commission (SFPUC), and non-potable water would be obtained from various sources in accordance with the City's Non-potable Water Ordinance. Further, this variant would not interfere with groundwater recharge because the change in impervious surfaces would be the same as would occur under the Proposed Project (see Impact HY-3). Therefore, under this variant, as with the Proposed Project, impacts related to depletion of groundwater resources and interference with groundwater recharge would be less than significant.

The Reduced Off-Haul Variant includes construction of the same shoreline improvements as the Proposed Project. Thus, the proposed top of bank elevation along the entire shoreline would be above the existing 100-year flood elevation; the projected future flood levels (even when a 100-year storm surge is considered in combination with the worst case scenario projected sea-level rise of 66 inches by 2100); and the estimated tsunami flood elevation (see Impacts HY-5 and HY-7). The final slopes along the waterfront would be similar to existing conditions and the new and improved revetments along the shoreline would not substantially alter the patterns of existing or future flood flows at the project site or in the vicinity. As with the Proposed Project, none of the proposed residences would be constructed within an existing or projected 100-year

flood zone. Therefore, impacts related to existing flooding, future flooding, and tsunami inundation would be less than significant, as for the Proposed Project.

Based on the above, project-level and cumulative hydrology and water quality impacts under the Reduced Off-Haul Variant would be similar to those identified under the Proposed Project (see Section 4.O, Hydrology and Water Quality). Implementation of the Reduced Off-Haul Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

HAZARDS AND HAZARDOUS MATERIALS

Under the Reduced Off-Haul Variant the depth and extent of excavation on Parcels C1, D, Parcels E1 through E4, H1, and H2 would generally be reduced and the base elevation of the southwestern portion of the 28-Acre Site would be raised. The Reduced Off-Haul Variant would not change other aspects of the Proposed Project related to the removal of the northern portion of the remnant Irish Hill for the construction of new 21st Street; construction of shoreline improvements; geotechnical stabilization (e.g., installation of structural wall solutions on the bayside of Parcels B and H2); the construction of the transportation, open space, and utility infrastructure networks; and other site improvements, including the Irish Hill Playground. Thus, ground disturbance related to demolition, excavation, site preparation and grading, geotechnical stabilization, and the emplacement of new infrastructure systems within the existing and new public rights-of-way under this variant would not be as great as that for the Proposed Project (including both scenarios, the three options for stormwater/wastewater management, and the three options for grading around Building 12).

The Reduced Off-Haul Variant would include less construction than would occur under the Proposed Project because of the decreased soil excavation volumes and elimination of basements at selected locations on the 28-Acre Site, and the elimination of a portion of one of the two below-grade basement levels on Parcel C1. Therefore, there would be less use of hazardous materials during construction. As for the Proposed Project, impacts related to use of hazardous materials during construction would be less than significant with implementations of an erosion and sediment control plan in accordance with Article 4.2 of the San Francisco Public Works Code or SWPPP in accordance with the SWRCB General Construction NPDES permit (see Impact HZ-1). These plans would identify hazardous materials sources within the construction area and recommend site-specific BMPs to prevent discharge of these materials into stormwater and San Francisco Bay waters.

Because the Reduced Off-Haul Variant would include the same land uses as would occur under the Proposed Project, it would include the same use of hazardous materials and generation of hazardous waste during operation. As for the Proposed Project, the use, storage, and management

of hazardous materials and wastes in accordance with Articles 21 and 22 of the San Francisco Health Code would ensure that impacts related to the routine use, transport, and disposal of hazardous materials during operation would be less than significant.

The Reduced Off-Haul Variant would involve demolition and renovation of the same buildings as would occur under the Proposed Project. As with the Proposed Project, compliance with Bay Area Air Quality Management District (BAAQMD) Rule 11, Regulation 2; Section 3426 of the Port of San Francisco Building Code; Occupation Safety and Health Administration Lead in Construction Standard; and other applicable regulatory requirements would ensure that impacts related to exposure to hazardous building materials would be less than significant (see Impact HZ-2). As for the Proposed Project, significant impacts related to the removal of polychlorinated biphenyl (PCB)-containing electrical transformers would occur under this variant. Thus, Mitigation Measures M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers, M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed, and M-HZ-2c: Conduct Soil Sampling if Stained Soil Is Observed, identified for the Proposed Project on p. 4.P.58,would also be applicable to this variant.

The Reduced Off-Haul Variant would involve excavation of approximately 56 percent less soil than would the Proposed Project. However, during construction the public, including students and staff at nearby schools as well as occupants of adjacent parcels that have previously been developed, could still be exposed to chemicals in the soil through inhalation of airborne dust, contact with accumulated dust, and contaminated runoff (see Impact HZ-3). As for the Proposed Project, impacts related to exposure to chemicals in the soil and groundwater during construction would be less than significant with implementation of Mitigation Measures M-HZ-3a: Implement Construction and Maintenance-Related Requirements of the Pier 70 Risk Management Plan and M-HZ-4: Implement Construction-Related Measures of the Hoedown Yard Site Management Plan. The Reduced Off-Haul Variant would also have the same potential to damage existing groundwater monitoring wells. However, as for the Proposed Project, this impact would be less than significant with implementation of Mitigation Measure M-HZ-3b: Implement Well Protection Requirements of the Pier 70 Risk Management Plan. As for the Proposed Project, implementation of Mitigation Measures M-HZ-3a and M-HZ-4 would also ensure that students and workers at nearby schools are not exposed to unacceptable levels of natural-occurring asbestos and metals under this variant (see Impact HZ-8). Because less construction would be conducted, the students and workers at nearby schools would also be exposed to less diesel particulate matter emissions and impacts associated with exposure to these emissions would remain less than significant.

The Reduced Off-Haul Variant would not include any changes to the Maximum Residential or Maximum Commercial Scenarios of the Proposed Project and the footprint of the proposed

developments would be approximately the same as the Proposed Project. Therefore, impacts related to the potential to interfere with PG&E's remediation of the PG&E responsibility area (which includes a portion of Parcel H1 and H2 and the southernmost part of the Waterfront Promenade, adjacent to the former Potrero Power Plant[5]) and exposure to chemicals in the soil within the Hoedown Yard during operation would be substantially the same as those discussed for the Proposed Project (see discussions under Impact HZ-5 and Impact HZ-7). As for the Proposed Project, these impacts would be less than significant with implementation of Mitigation Measures M-HZ-5: Delay Development on Parcel H2 Until Remediation of the PG&E Responsibility Area is Complete and M-HZ-7: Modify Hoedown Yard Site Mitigation Plan. Residential uses on Parcel H1 would not include a basement under the Reduced Off-Haul Variant which would result in less of a potential for adverse health effects due to vapor intrusion, but implementation of Mitigation Measure M-HZ-6: Additional Risk Evaluations and Vapor Control Measures for Residential Land Uses would still be required for this variant to ensure that impacts to residential users would be less than significant.

Similar to the Proposed Project, future site occupants and users of the future Irish Hill Playground could be exposed to naturally-occurring asbestos and metals under the Reduced Off-Haul Variant. Because the land uses would be the same under this variant, including the use of the Irish Hill Playground, Mitigation Measures M-HZ-8a: Prevent Contact with Serpentinite Bedrock and Fill Materials and M-HZ-8b: Restrictions on the Use of Irish Hill Playground would also be required to reduce this impact to a less than significant level.

Based on the above, project-level and cumulative hazards and hazardous materials impacts under the Reduced Off-Haul Variant would be similar to those identified under the Proposed Project (see Section 4.P, Hazards and Hazardous Materials). Implementation of the Reduced Off-Haul Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

[5] Haley & Aldrich, Draft Remedial Action Plan, Northeast Area of the Potrero Power Plant Site and a Portion of the Southeast Area of Pier 70, Potrero Power Plant Site, San Francisco, California, July 7, 2015.

B. DISTRICT ENERGY SYSTEM VARIANT

Introduction

A district energy system for the 28-Acre Site and the Illinois Parcels is being explored; therefore, it is analyzed as a variant to the Proposed Project.[6] The District Energy System Variant is an infrastructure-related variant. It would involve the development of a central plant in the basement level of Parcel C1 and would link the space heating and cooling systems of all proposed buildings to a closed thermal loop that would circulate low temperature water via a network of subsurface pipelines. This district energy system would be developed in place of the separate heating and cooling systems assumed for each building under the Proposed Project. The Proposed Project assumes that each building's heating and cooling demand would be met by natural gas supplied by PG&E, electricity supplied by SFPUC, and/or renewable power generated on the project site (e.g., roof-mounted or building-integrated solar photovoltaic (PV) systems and/or roof-mounted solar thermal hot water systems for all proposed buildings, if implemented). A centralized energy system generally provides higher efficiencies than boilers and chillers located in each individual building used to meet space heating and cooling demand.

The District Energy System Variant does not include any changes to the land use programs for the Maximum Residential or Maximum Commercial Scenarios defined for the Proposed Project. As discussed in Chapter 2, Project Description, the above-grade development options for Parcel C1 include development of an above-grade parking structure, a residential building, or commercial building. The Parcel C1 development options would remain applicable to this variant. The land use programs and project site improvements would be implemented in a similar fashion as that for the Proposed Project.

Description

Under the District Energy System Variant, building space heating and space cooling systems within the project site would be linked together via an underground shared energy distribution and exchange loop. This variant would include a single central plant with boilers and chillers to regulate the water temperature circulating in the network of subsurface pipes and laterals leading to all buildings on the 28-Acre-Site. The central plant would be located in the basement of a building on Parcel C1, which is located at the corner of new Louisiana and 21st streets. Development of Parcel C1 could be an above-grade parking structure, a residential building, or commercial building; all with two below-grade basement levels.

[6] Forest City, *Draft* Pier 70 Sustainability Plan, January 2016 Draft, Section 7.1 Climate Protection and Energy Efficiency, pp. 58-59.

The central plant would have a footprint of approximately 8,000 to 14,000 square feet, depending on the equipment used. Exhaust ducts would be required on the roof or façade. The central plant would contain heat exchangers, pumps, boilers, and other ancillary equipment. Up to five 15- to 29-foot-tall cooling towers would be located on the roof or would be located adjacent to the building and would obviate the need, under the Proposed Project, for a mechanical cooling tower located on the roof of each building.

The water would be heated using one or more natural gas-fired boilers and cooled with electric chillers tied to centralized cooling towers. The single central energy plant would circulate the conditioned water to individual buildings via a thermal distribution network located under the proposed street network. The pipeline system would be located at a depth consistent with other standard water pipelines and connect to each building on the project site via laterals.

Similar to the Proposed Project, the district energy system would not provide hot water to the buildings; hot water would be provided from separate heat pumps in each building. Each building on the project site would have heat pumps and a point-of-connection to the energy distribution loop tied to the water loop to provide space heating, hot water, and cooling to more efficiently meet building thermal demands. Buildings that require heat would remove heat from the loop. Buildings that require cooling would reject that heat by pumping heated water into the loop, thereby enhancing the efficiency of each building's heating, ventilation, and air conditioning (HVAC) system. The peak water flow capacity of the closed loop system would be approximately 9,000 gallons per minute. The desired temperature range of the water in the loop would be 50°F to 90°F. To maintain the loop at a desired temperature, the central plant would use natural-gas fired boilers to increase heat and cooling towers to reject heat.

PROPOSED CONSTRUCTION PHASING

Under the District Energy System Variant, demolition, excavation, site grading, and construction activities would be conducted according to the construction phases described in Chapter 2, Project Description, and would be substantially the same as under the Proposed Project. The district energy system's central plant would be constructed as part of Phase 2 under the Maximum Residential Scenario as part of the development of Parcel C1. Under the Maximum Commercial Scenario the conceptual timeline for the development of Parcel C1 may be altered (from Phase 4 under the Proposed Project to Phase 2 under the District Energy System Variant to accommodate the central plant. Under either scenario, the associated piping system would be constructed according to the construction phases detailed in Chapter 2, Project Description, Tables 2.5 and 2.6, pp. 2.80-2.81 and p. 2.84. The District Energy System Variant would include demolition of the same buildings as well as construction of the same shoreline improvements and transportation, utility, and open space networks. The District Energy System Variant would not change any aspect of the Proposed Project related to demolition, excavation, and site grading; the

construction of shoreline improvements; geotechnical stabilization; the construction of the transportation, open space, and utility infrastructure networks; or other improvements such as the construction of the new 20th Street pump station. Proposed development is expected to involve up to five phases (Phases 1 through 5) and is conceptual; however construction is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. As with the Proposed Project, the multi-phased approach to project site development would result in project site occupancy and operations overlapping with, and being affected by, future construction phases.

Proposed Land Use Programs

The District Energy System Variant does not include any changes to the land use programs for the Maximum Residential Scenario or Maximum Commercial Scenario defined for the Proposed Project or changes to the proposed open space network, traffic and circulation plan, new infrastructure and utility plans, geotechnical stabilization plan, or the shoreline improvement plan described in Chapter 2, Project Description.

Impact Evaluation

APPROACH TO ANALYSIS

The District Energy System Variant does not involve any change to the mix of land uses, the space allocation of uses, or the residential unit count under the Maximum Residential and Maximum Commercial Scenarios of the Proposed Project. Likewise, this variant would not involve any change to the locations, configurations, or building envelopes of the programmed development under the two scenarios analyzed for the Proposed Project. While expected to be located in a basement on Parcel C1, the physical plant would not involve additional excavation beyond that already assumed for the Proposed Project; therefore it would not change the effects of the Proposed Project on archaeological resources or the effects of geology and soils. The cooling tower would be 20 feet tall or less with similarly-sized diameter. These features of the physical plant would be considerably shorter than the tallest buildings assumed to be on the project site under either scenario, and therefore would have no material effect on pedestrian-level wind conditions and would not cast notable shadows. Excavation and construction techniques used to install the thermal loop pipeline throughout the site would be the same as those used to install other utility piping. Based on this description, physical environmental effects under this variant would be substantially the same as those identified for the Proposed Project for the following environmental topics: Land Use and Land Use Planning, Population and Housing, Cultural Resources (Archaeological Resources and Historic Architectural Resources), Wind and Shadow, Recreation, Public Services, Biological Resources, Geology and Soils, and Agricultural

and Forest Resources. All mitigation and improvement measures described for these topics under the Proposed Project would be applicable to this variant.

The following environmental topics are analyzed for this variant: Transportation and Circulation, Noise and Vibration, Air Quality, Greenhouse Gas Emissions, Utilities and Service Systems, Hydrology and Water Quality, Hazards and Hazardous Materials, and Mineral and Energy Resources.

TRANSPORTATION AND CIRCULATION

Demolition, excavation, site grading, and construction activities under the District Energy System Variant would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. Under this variant the district energy system facility would be installed during the second construction phase as part of the development of Parcel C1) and would be located at the basement level of the new building on Parcel C1. The associated collection and distribution pipeline system would be emplaced within the public right-of-way at the same time as the construction of the proposed transportation and utility infrastructure networks and the adjacent Parcels. As a result there would be no additional construction truck traffic trips associated with central plant component of this variant as Parcel C1 would also be developed as part of the Proposed Project. However, there would be a slight increase in construction truck traffic trips for the transport and installation of the various equipment that constitute the district energy system facility including the subsurface pipelines and the cooling tower(s). Construction truck traffic associated with constructing and installing equipment for the District Energy System Variant would thus make up a relatively small portion of the construction truck traffic generated during each construction phase. As discussed under Impact TR-1 for the Proposed Project, this variant would also use the same construction truck traffic routes (e.g., Third Street and either 25th or Mariposa streets to access I-280 to travel south; Third Street and either Second or Fifth streets to reach the Bay Bridge and the East Bay; and Third Street, Howard Street, and Van Ness Avenue (U.S. 101) to travel to North Bay destinations). The temporary (and less than significant) impacts associated with construction-related traffic of the Proposed Project are described under Impact TR-1, and that impact analysis would be applicable to this variant because the amount of construction truck traffic specific to the implementation of this variant would be minimal and would not lead to a different conclusion.

The District Energy System Variant would not result in substantial increases in operational VMT because it does not alter the development scenarios for the Proposed Project. With respect to operational impacts, the maintenance needed at individual buildings with a centralized system as under the District Energy System Variant would be less than that needed to maintain separate heating and cooling systems in each building under the Proposed Project. Therefore there could be slightly fewer service truck trips to and from the project site for maintenance activities with the

District Energy System Variant. Any reduction in service truck trips would be small and would not substantially affect total vehicle miles traveled as a result of operations of the Proposed Project. There would be no change to transit, pedestrian, or bicycle effects from the District Energy System Variant. Delivery of supplies for operation and maintenance of the central plant would be similar to loading activities described for the Proposed Project, and would not substantially increase the demand for loading facilities. Emergency access would not be expected to be affected by a district energy system located within and adjacent to proposed new buildings on the project site. The truck trips associated with the maintenance and operation of the central plant under the District Energy System Variant (e.g., centralized activities as opposed to being dispersed throughout the project site) would change the circulation patterns on the project site but the change would be minimal. Therefore, operational-related project-level and cumulative transportation and circulation impacts under the District Energy System Variant would be substantially the same as those discussed for the Proposed Project (see Section 4.E, Transportation and Circulation). Thus, all operational-related mitigation measures identified for the Proposed Project would be applicable to the District Energy System Variant (i.e., Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed [pp. 4.E.91 to 4.E.93] under Impact TR-5; Mitigation Measure M-TR-10: Improve pedestrian facilities on Illinois Street adjacent to and leading to the project site [pp. 4.E.99-4.E.100] under Impact TR-10; Mitigation Measure M-TR-12a: The Project's Transportation Coordinator should coordinate with building tenants and delivery services to minimize deliveries during a.m. and p.m. peak periods [p. 4.E.105] under Impact TR-12; Mitigation Measure M-TR-12b: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed [p. 4.E.105] under Impact TR-12; Mitigation Measure M-C-TR-4a: Increase capacity on the 48 Quintara/24th Street bus route under the Maximum Residential Scenario [p. 4.E.118] under Impact C-TR-4; and Mitigation Measure M-C-TR-4b: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario [p. 4.E.118] under Impact C-TR-4). The proposed modifications to the below-grade parking program under this variant (i.e., removal of a portion of one of the two basement levels on Parcel C1) would not result in any changes to the overall parking program. Parking spaces that would not be available under this variant would be provided in building podiums and as part of a structured parking program on Parcels C1 and C2 (if implemented).

Based on the above, project-level and cumulative transportation and circulation impacts under the District Energy System Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.E, Transportation and Circulation). Implementation of the District Energy System Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

NOISE AND VIBRATION

Construction of District Energy System Variant facilities would cause temporary construction noise. Construction noise would be similar to or the same as that discussed for construction of the Proposed Project in Section 4.F, Noise and Vibration. Mitigation Measure M-NO-1, pp. 4.F.33-4.F.35, would decrease construction noise levels by requiring construction contractors to implement noise reduction measures for construction activities. If the central plant and cooling tower were constructed in one of the later phases of project buildout, it could contribute to the significant construction noise impact on new residents living in residential buildings constructed in an earlier phase, as identified in Impact NO-2. This would not be a new significant impact from construction of the variant, but construction of the variant could contribute to this significant impact. Similarly, construction of the central plant and/or cooling tower would contribute to significant construction noise impacts if pile driving were required and vibratory pile driving methods included in Mitigation Measure M-NO-2 were determined to be infeasible. With implementation of Mitigation Measures M-NO-1 and M-NO-2, construction of the variant would not result in new significant construction-related impacts not already identified for the Proposed Project nor would this variant exacerbate (or make more severe) the identified impacts (see Section 4.F, Noise and Vibration).

With respect to operational impacts, the central plant would generate mechanical noise. Because the central plant is proposed to be located in the basement of a building, noise-generating equipment would be shielded by the building structure. Since the cooling tower is considered to be mechanical equipment (i.e., it has fans and other mechanical features that produce noise), implementation of Mitigation Measure M-NO-4a: Stationary Equipment Noise Controls, would ensure that noise attenuating features such as a noise reducing shield would achieve the necessary noise reduction to meet the City's Noise Ordinance, as with the Proposed Project. Therefore, operational noise impacts under the variant would not change the conclusions or mitigation measures identified in Section 4.F, Noise and Vibration, for the Proposed Project.

Based on the above, project-level and cumulative noise and vibration impacts under the District Energy System Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.F, Noise and Vibration). Implementation of the District Energy System Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

AIR QUALITY

Construction and installation of the District Energy System Variant would result in temporary construction dust and temporary emissions from construction equipment and trucks. These construction air quality impacts would be similar to, but slightly greater than, those described for

the Proposed Project (see Section 4.G, Air Quality, Impact AQ-1) since they are part of the development of Parcel C1. However, there would be in an incremental increase in construction truck trips over that for the Proposed Project due to construction of the plant and materials delivery, i.e., equipment and associated piping system. The Construction Dust Control Ordinance would be applicable to construction of the District Energy System Variant, as with other construction activities for the Proposed Project. The same construction mitigation measure for the Proposed Project, Mitigation Measure M-AQ-1a: Construction Emissions Minimization on pp. 4.G.42-4.G.44, would apply to the District Energy System Variant facilities if the construction of the particular component of this system were to occur during construction of Phases 3, 4, and 5, or after buildout of 1.3 million gross square feet of development, whichever comes first. Construction of the District Energy System Variant would contribute to a significant and unavoidable air quality impact if it was constructed during later phases of the Proposed Project when operational emissions from earlier phases are also accounted for, even with implementation of Mitigation Measure M-AQ-1a and relevant operational mitigation measures (Mitigation Measures M-AQ-1b through M-AQ-1h), as discussed for the Proposed Project on pp. 4.G.42-4.G.51.

Regarding operations, the District Energy System Variant would likely produce less criteria pollutant emissions related to natural gas burning than the Proposed Project because the centralized plant would be more efficient and would burn less natural gas than individual heating equipment in each building under the Proposed Project. New boilers would require permits from the BAAQMD that would place conditions on emissions and annual operations. Emissions from the District Energy System Variant would contribute to daily and annual increases in emissions from the Proposed Project, but could result in somewhat reduced emissions due to the efficiency of such a system as compared to the Proposed Project. There is not enough detail available about the District Energy System Variant to determine whether the reduction in emissions would substantially reduce the significant air quality impacts identified in Impact AQ-2, but based on the level of emissions calculated for the Proposed Project, it is not expected that any reductions achieved as a result of implementing the District Energy System Variant would reduce the significant impact to a less-than-significant level. Therefore, as with the Proposed Project, operational air quality impacts under this variant would be significant and unavoidable with mitigation.

As discussed under Impact AQ-3, the exposure of off-site sensitive receptors to excess cancer risk due to TAC emissions from construction and operation would be less than significant under the Proposed Project. As further discussed under Impact AQ-3), the exposure of on-site sensitive receptors (after completion of Phases 1 and 2) to excess cancer risk due to TAC emissions from construction and operation would be reduced to less-than-significant levels with implementation of Mitigation Measures M-AQ-1a: Construction Emissions Minimization, M-AQ-1b: Diesel

Backup Generator Specifications, M-AQ-1c: Use Low- and Super-Compliant VOC Architectural Coatings in Maintaining Buildings through CC&Rs, and M-AQ-1f: Transportation Demand Management).

As with the Proposed Project, the District Energy System Variant would be consistent with the 2010 Clean Air Plan, and impacts would be less than significant with implementation of the Transportation Demand Management Plan (TDM) (see "TDM Plan," in Section 4.E, Transportation and Circulation, pp. 4.E.46-4.E.47), which includes strategies to discourage the use of automobiles and encourage transit and other modes of transportation. Other mitigation measures of the Proposed Project, identified under Impact AQ-1 that would also be applicable to the District Energy System Variant in regards to consistency with the 2010 Clean Air Plan are as follows:

- Mitigation Measure M-AQ-1a : Construction Emissions Minimization Plan (requiring low NOx emitting construction vehicles; requiring Tier 4, low-emissions construction vehicles),
- Mitigation Measure M-AQ-1b: Diesel Backup Generator Specifications (reducing NOx associated with operation)
- Mitigation Measure M-AQ-1f: Transportation Demand Management
- Mitigation Measure M-AQ-1g: Additional Mobile Source Control Measures (preferential parking and/or charging stations for fuel-efficient vehicles and a neighborhood electric vehicle program), and
- Mitigation Measure M-AQ-1h: Emissions Offset of Operational Emissions (implement replacement or repair of high-emitting vehicles).

Thus, as with the Proposed Project, the implementation of the TDM strategies and mitigation measures would ensure the project includes relevant transportation control measures specified in the Clean Air Plan (see Impact AQ-4). The TDM Plan and mitigation measures would be applicable to the District Energy System Variant ensuring that implementation of the District Energy System Variant would also be less-than significant with mitigation.

As with the Proposed Project, the impacts of the District Energy System Variant in terms of its potential to create objectionable odors that would affect a substantial number of people (see Impact AQ-5) would be less than significant.

Based on the above, project-level and cumulative air quality impacts under the District Energy System Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.G, Air Quality). The impacts under the District Energy System Variant could be greater during construction phases due to an increase in construction truck trips, but slightly less during operations due to the efficiencies the District Energy System Variant offers. Implementation of the District Energy System Variant would not result in new or more severe

impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

GREENHOUSE GAS EMISSIONS

A variety of controls are in place to ensure that development in San Francisco would not impair the State's ability to meet Statewide GHG reduction targets outlined in AB 32, nor impact the City's ability to meet San Francisco's local GHG reduction targets. Projects that are consistent with San Francisco's GHG Reduction Strategy would not contribute significantly to global climate change. Similar to the Proposed Project, the District Energy System Variant would be required to comply with these regulations and requirements that reduce GHG emissions (see Table 4.H.2: Regulations Applicable to the Proposed Project, in Section 4.H, Greenhouse Gas Emissions, starting on p. 4.H.13). Since the District Energy System Variant would comply with GHG reduction measures required in various City ordinances and would be consistent with all the regulations applicable to the Proposed Project, it would comply with San Francisco's Greenhouse Gas Reduction Strategy. Therefore, as with the Proposed Project, the District Energy System Variant would have a less than cumulatively considerable contribution to significant cumulative GHG impacts.

Implementation of the District Energy System Variant would result in an incremental increase in construction truck trips over that for the Proposed Project due to construction of the District Energy System plant and materials delivery, i.e., equipment and associated piping system. Thus construction activities under this variant that would result in GHG emissions would be slightly greater than those for the Proposed Project.

The District Energy System Variant would not alter the GHG emissions associated with operation of the Proposed Project because this variant would not change the two land use scenarios defined for the Proposed Project. As with the Proposed Project, this variant would introduce a mixed-use development in an area that is served by public transit, and would include Class I and Class II bicycle parking spaces, energy efficiency features beyond Title 24 requirements, low-impact stormwater management design, water-efficient landscaping, water-conserving interior design, convenient recycling and composting, street trees, and other features consistent with San Francisco's ordinances and requirements. Similar to the Proposed Project, development would be consistent with the Sustainable Communities Strategy by including residential and commercial uses in a designated Priority Development Area per Plan Bay Area, furthering the region's goals for reducing GHG emissions. Implementation of local GHG reduction requirements would substantially reduce a project's GHG emissions. In addition, under the District Energy System Variant energy usage would be more efficient than under the Proposed Project, and, as a result, GHG emissions with implementation of this variant may not be as great as that for the Proposed Project. Furthermore, as described in Section 4.H, Greenhouse Gas Emission, implementation of

air quality mitigation measures would also have the added benefit of further reducing GHG emissions from the Proposed Project. Mitigation Measures M-AQ-1a through M-AQ-1h, shown in Section 4.G, Air Quality, on pp. 4.G.42-4.G.50, would help reduce emissions of GHGs through the reduction in construction emissions; limitations on diesel generators; use of low VOC architectural coatings and green consumer products; electrification of loading docks; encouragement of the use of transit and non-motorized modes of transportation; and emission offsets. These mitigation measures would also be applicable to the District Energy System Variant and would further reduce this variant's less-than-significant GHG emissions.

Based on the above, GHG impacts under the District Energy System Variant would be similar to those identified under the Proposed Project (see Section 4.H, Greenhouse Gas Emissions). Implementation of the District Energy System Variant would not result in new or substantially more severe impacts and would not change the analysis or conclusions in that section.

UTILITIES AND SERVICE SYSTEMS

The District Energy System Variant would not include any changes to the Maximum Residential Scenario or Maximum Commercial Scenario defined for the Proposed Project. The variant would not change any utility infrastructure networks in the Proposed Project. Construction techniques would be the same as for the Proposed Project. The variant would include the same new infrastructure for the distribution of potable water, emergency firefighting water, and recycled water as well as for the conveyance of wastewater and stormwater, including the new 20th Street pump station. The same three wastewater and stormwater management options (combined sewer system, separate systems, and hybrid system) are under consideration for this variant as for the Proposed Project.

Water Supply

Cooling tower makeup water volume would be approximately 13,700 to 16,500 gallons per day, or 0.014 to 0.16 million gallons per day (mgd), or 5 to 6 million gallons per year. This would be an increase in water demand of about 2.7 to 3.2 percent compared to the water demand for the Maximum Residential Scenario or 3.1 to 3.8 percent for the Maximum Commercial Scenario, if all potable water were used, as presented in Section 4.K, Utilities and Service Systems, in Table 4.K.4: Average Daily Water Demands at Full Build-out (p. 4.K.32). Assuming compliance with the City's Non-potable Water Ordinance, less potable water would be used by the Proposed Project. Under these conditions, the cooling tower makeup water would be a 3.6 to 4.3 percent increase in the demand for potable water compared to the demand from the Maximum Residential Scenario and 4.7 to 5.7 percent for the Maximum Commercial Scenario.

If non-potable, recycled water were used in the cooling water system, the variant would not affect the demand for potable water; however, as explained in Section 4.K under "Water Demands Once Off-Site Recycled Water from the City Is Available," the City plans to provide recycled water by the year 2029. Therefore, while this scenario would eliminate the demand for potable water in the District Energy System Variant, the analysis does not assume that recycled water would be available.

In summary, the variant would result in a small increase in daily water demand for the Proposed Project. This increase would not be large enough to trigger the need for new or expanded water supply resources or entitlements because it would not make up a substantial percentage of the overall citywide demand for potable water, which the SFPUC determined (in conjunction with 2010 Urban Water Management Plan information on available water supplies) as sufficient.[7] The 2013 Water Availability Study determined that the SFPUC can meet the future demands of its retail customers.[8] Therefore the variant would not change the analysis or conclusions with regard to water supply presented for the Proposed Project in Section 4.K, Hydrology and Water Quality.

Wastewater Facilities

While the District Energy System Variant would require regular amounts of makeup water, the losses in volume would be mainly due to evaporation. Relatively small amounts would be discharged to the wastewater collection and treatment system as cooling tower blowdown (water that is removed from the system to reduce mineral buildup that can damage the system by adding fresh water). The District Energy System facilities would be cross-connected with the sewer system and would continuously discharge small volumes of wastewater to the sewer system depending on the cooling demands of the project site (i.e., would not be not large infrequent discharge volumes). Only about 25 percent of the supply water would be discharged to the sewer system as the rest would evaporate in the heat rejection process. Therefore, implementation of the Proposed Project with this variant would likely not cause exceedances of wastewater treatment requirements because of the relatively benign quality of the water purged from the District Energy System facilities or result in the need to construct new collection or treatment facilities because the volumes would not be substantial. Thus, implementation of this variant would have less than significant impacts, as for the Proposed Project.

Solid Waste

The District Energy System Variant would not change the amount of solid waste generated. Therefore the impact and conclusions in Section 4.K under Impacts UT-6 and UT-7, determining

[7] SFPUC, *2010 Urban Water Management Plan for the City and County of San Francisco*, June 2011.
[8] SFPUC, *2013 Water Availability Study for the City and County of San Francisco*, May 2013.

that the Proposed Project would have less-than-significant impacts related to solid waste disposal, would not change with implementation of this variant.

Based on the above, project-level and cumulative utilities and service systems impacts under the District Energy System Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.K, Utilities and Service Systems). Implementation of the District Energy System Variant would not result in new or more severe impacts, would not change the analysis or conclusions in that section, and no new mitigation measures would be required.

HYDROLOGY

Hydrology and water quality impacts under the District Energy System Variant would be similar to the environmental impacts addressed in Section 4.O, Hydrology and Water Quality, for the Proposed Project. The proposed central plant would be constructed on the project site and within the same stormwater drainage basin as the Proposed Project. Because the central plant would likely be located within the basement level of a building on Parcel C1, and the cooling tower would be located adjacent to the central plant on property expected to contain structures, the central plant and cooling tower would not result in a substantial change in the amount of impervious surfaces or stormwater drainage.

Installation of a district heating and cooling system would require additional water usage, primarily for cooling water makeup. Cooling tower blowdown typically contains elevated levels of total dissolved solids, and may contain elevated levels of metals and other constituents. Cooling tower blowdown, and other plant process water would likely be discharged to the combined sewer system or the sanitary sewer system, depending on the option selected (see Section 4.O, Hydrology and Water Quality), and then treated at and discharged from the Southeast Water Pollution Control Plant (SEWPCP). This would not substantially alter water quality, as the discharge would be required to comply with City regulatory requirements in San Francisco Public Works Code Article 4.1, Wastewater Discharges to the Combined Sewer System (see Regulatory Framework, in Section 4.O, particularly p. 4.O.38).

The use of a cooling tower could result in increases in the volume of discharge to the wastewater system that could contribute to exceedances in the capacity of the existing 20th Street pump station discussed in Impact HY-2 in Section 4.O, Hydrology and Water Quality. Construction of a new 20th Street pump station would, with implementation of Mitigation Measure M-HY-2a: Design and Construction of Proposed Pump Station for Options 1 and 3, or Mitigation Measure M-HY-2b: Design and Construction of Proposed Pump Station for Option 2, presented on pp. 4.O.60-4.O.61, accommodate increased wastewater flows and would result in less-than-significant impacts. The District Energy System Variant would not use or affect groundwater or

affect the existing drainage patterns, and would have less-than-significant impacts, as for the Proposed Project.

Based on the above, project-level and cumulative hydrology and water quality impacts under the District Energy System Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.O, Hydrology and Water Quality). Implementation of the District Energy System Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

HAZARDS AND HAZARDOUS MATERIALS

Hazards and hazardous materials impacts under the District Energy System Variant would be the same as, or similar to, the environmental impacts addressed in Section 4.P, Hazards and Hazardous Materials, for the Proposed Project. Although the district energy system infrastructure would be developed as part of Parcel C1 its operation could introduce hazards between future pedestrians, motorists, and site users (e.g., adjacencies at the basement level or cooling tower), the design of the district energy system facility and the siting of associated equipment (e.g., cooling tower) would adhere to the San Francisco and Port Building Codes and other applicable regulations that would ensure that exposure to hazards would be minimized. For example, the district energy system plant would be separated from the parking portion of the basement level and the cooling tower would be appropriately screened and sited to minimize potential risks related to operational hazards. Therefore, the project-level and cumulative hazards and hazardous materials impacts resulting from construction and operation of the District Energy System Variant would be similar to those under the Proposed Project (see Section 4.P, Hazards and Hazardous Materials). Implementation of the District Energy System Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

MINERAL AND ENERGY RESOURCES

Environmental impacts associated with mineral and energy resources under the District Energy System Variant would be the same as or similar to the environmental impacts addressed in Section 4.Q, Mineral and Energy Resources, for the Proposed Project. The variant would have no impact on mineral resources, consistent with the Proposed Project as addressed in Impact ME-1. Demolition, excavation, site grading, and construction activities under the District Energy System Variant would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. As described above, under this variant the construction of the District Energy System plant would occur as part of the second phase of development. Construction of the associated pipeline system would occur according to the phase associated

with the adjacent Parcels and would occur in concert with other infrastructure improvements. Implementation of the District Energy System Variant would result in a slight increase in construction truck trips due to the need to transport materials for the installation of the new facility and associated pipeline system. Due to the increased fuel usage for the additional construction truck trips, construction-related energy impacts under this variant would be slightly greater than those for the Proposed Project. However, as with the Proposed Project, energy impacts under this variant would be less than significant because construction-related activities would be temporary.

Implementation of the variant would be expected to result in less natural gas use than the Proposed Project, as shown in Table 4.Q.1, because the central plant and cooling tower would be more efficient, and would burn less natural gas than individual boilers in buildings under the Proposed Project.

Therefore, the project-level and cumulative mineral and energy resources impacts resulting from the construction and operation of the District Energy System Variant would have no impact or be less than significant, as described in Section 4.Q, Mineral and Energy Resources, under Impacts ME-1, ME-2, and ME-3 for the Proposed Project, and would not change the analysis or conclusions in that section.

C. WASTEWATER TREATMENT AND REUSE SYSTEM VARIANT

Introduction

Under the WTRS Variant, wastewater in the form of blackwater (wastewater from toilets, urinals, dishwashers, kitchen sinks, and utility sinks containing feces, urine, other bodily wastes, or other biological wastes), graywater and rainwater would be collected from all newly constructed buildings, treated, and reused for toilet and urinal flushing, irrigation, and cooling towers. The WTRS Variant is an infrastructure-related variant. This variant assumes that all newly constructed buildings would be served by the one central WTRS plant, and that a separate collection and distribution pipeline system would be installed in tandem with other infrastructure improvements. The WTRS Variant is different from the Proposed Project because it would include a centralized facility (as opposed to the capture of graywater and rain water and its reuse within the individual building). Unlike the Proposed Project, this variant also assumes blackwater would be collected and treated along with the graywater and rainwater that would be captured under the Proposed Project.

The WTRS Variant does not include any changes to the land use programs for the Maximum Residential Scenario or Maximum Commercial Scenario defined for the Proposed Project. The

land use programs and project site improvements would be implemented in a similar fashion as that for the Proposed Project.

Description

The WTRS Variant would consist of a single treatment facility to be located either in an existing building (Building 108) or in a new building (approximately 20,000 square feet and 35 feet tall) on an asphalt lot located on the BAE Systems Ship Repair site north of 20th Street opposite the proposed commercial office uses on Parcels A and B.[9] See Figure 2.5: Proposed SUD Land Use Program, in Chapter 2, Project Description, p. 2.22, for the location of these parcels in relation to the BAE Systems Ship Repair site. If the WTRS plant is located within Building 108, Building 108 would be structurally and seismically upgraded to ensure that the building would continue operation in the event of an emergency, and security improvements would be made to restrict public access to the WTRS plant. A driveway would be constructed adjacent to Building 108 or the new building on the asphalt lot to allow access for maintenance and servicing and all building improvements would be reviewed and approved by the Port. The WTRS plant would use electrical power and water treatment chemicals and would be fully enclosed within Building 108 or the new building on the asphalt lot. Odor control units would be installed and exhaust gases would likely be vented at the top of the building housing the WTRS plant. All the interior and exterior improvements to Building 108 would meet the *Secretary of Interior's Standards*. The associated collection and distribution piping would be emplaced under the proposed public rights-of-way and would connect all new buildings that would be located on Parcels A, B, C1, C2, D, E1 through E4, F, G, H1, H2, HDY1, HDY2, PKN, and PKS and rehabilitated Building 2 to the WTRS plant.[10] The piping system would be connected to the City's combined sewer system to discharge wastewater flows in excess of non-potable (water reuse) demand in accordance with Article 4.1 of the San Francisco Public Works Code, as supplemented by Order No. 158170. Discharges to the combined sewer system would also occur when the treatment and distribution system is shut down for maintenance and permit-required testing; and in case of emergency shut down.

The WTRS plant would include primary treatment (removal of large debris), secondary treatment (biological breakdown of organic materials), and advanced treatment (various methods of eliminating pathogens and certain other pollutants). The WTRS plant would include at least the following components or functions: feed tank (wastewater input), trash trap, bioreactor, and a disinfection and storage tank. Collected wastewater would be treated to meet the water quality

[9] AECOM, Memorandum to Forest City, re: "District-scale Wastewater Treatment and Reuse Project Summary," September 27, 2016, Figure 1 on p. 4.
[10] Ibid.

criteria as set forth by the San Francisco Department of Public Health (DPH) Director's Rules and Regulations for the Operation of Alternate Water Source System.[11] The distribution system for treated non-potable water for reuse would have backflow protection and meet other requirements to prevent contamination of the potable water supply. Chemicals required for the treatment process would be stored at the treatment plant and would include membrane cleaning acid (if membranes are used for advanced treatment) and an oxidizing disinfection agent such as sodium hypochlorite.

The project sponsors or an independent operator would construct and operate the WTRS plant. The SFPUC would review and approve the alternate water sources and non-potable applications while DPH would review and approve the engineering report for the WTRS plant and issue the permit for operation. DBI would issue the building and plumbing permits for the WTRS plant. The WTRS plant would also be permitted and regulated by the BAAQMD because it would include stationary equipment that emits to the atmosphere. The WTRS plant would be required to have a Hazardous Materials Business Plan that identifies incident response procedures in accordance with Article 21 of the San Francisco Health Code. Emergency response procedures for addressing chemical spills or gas releases related to the operation of the WTRS plant as well as procedures in the case of earthquakes, fire, and other natural disasters would be delineated in these plans.

The proposed WTRS plant would be constructed as part of the first phase of development, would be sized for a total capacity of up to approximately 150,000 gallons per day, would have a footprint of approximately 10,000 to 20,000 square feet, and would be designed to allow expansion of the treatment capacity as new project phases are completed. When expressed in the same unit of measure as that done for the Proposed Project, the capacity of the proposed WTRS plant would be 0.15 mgd. The estimated demand for non-potable water for the Maximum Residential Scenario and Maximum Commercial Scenario of the Proposed Project would be approximately 0.13 mgd and 0.15 mgd, respectively.[12] Actual water reuse quantities would be determined in part by San Francisco Health Code Section 12.C.4, regarding Water Budget Documentation and related requirements. The sewer demand estimates for the Proposed Project already assume compliance with the City's Non-potable Water Ordinance. Therefore, this variant would result in the same potable water and sewer demands as would the Proposed Project.

[11] California Office of Administrative Law, California Code of Regulations. Available online at https://govt.westlaw.com/calregs/Index?transitionType=Default&contextData=%28sc.Default%29. Accessed July 11, 2016.

[12] BKF, Memorandum to Forest City, re: Pier 70 – Water Demand Memorandum, April 28, 2016, p. 4, and Tables 3 and 4 on pp. 7-8.

The WTRS plant would receive wastewater from buildings on Parcels A, B, C1, C2, D, E1 through E4, F, G, H1, H2, HDY1, HDY2, PKN, and PKS and rehabilitated Building 2, and send treated water back to the same group of buildings. Wastewater flows in excess of the non-potable water demand would be discharged into the combined sewer system in accordance with Article 4.1 of the San Francisco Public Works Code, as supplemented by Order No. 158170. In case the WTRS plant needs to be shut down and recycled water becomes temporarily unavailable, the City's recycled water supply would be used as backup supply when it becomes available.[13] In the meantime, a supplemental potable water supply with appropriate cross connection prevention measures (e.g., air gap) to the non-potable water system would be available.

Truck delivery of chemicals for the WTRS Variant would be once every two to six weeks. Excess liquid waste from the WTRS plant would be discharged into the combined sewer system or the new separate wastewater system, depending on which of the Proposed Project's wastewater and stormwater management options is implemented. Alternatively, the liquid waste could be hauled away by truck for processing at a location that is permitted to accept the liquid waste. Trash trap waste would be double-bagged and disposed at a landfill. Approximately two truck trips per week have been assumed for off-site hauling of trash trap waste and liquid waste, and for chemical storehouse replenishment.[14]

PROPOSED CONSTRUCTION PHASING

Under the WTRS Variant, demolition, excavation, site grading, and construction activities would be conducted according to the construction phases described in Chapter 2, Project Description, and would be substantially the same as under the Proposed Project. Under both the Maximum Residential Scenario and Commercial Scenario the WTRS plant would be constructed as part of Phase 1 (see Table 2.5: Project Construction and Rehabilitation Phasing for the Maximum Residential Scenario, and Table 2.6: Project Construction and Rehabilitation Phasing for the Maximum Commercial Scenario, in Chapter 2, Project Description). Under either scenario, the associated piping system would be constructed according to the construction phases detailed in Tables 2.5 and 2.6 (i.e., with infrastructure improvements and the development of adjacent parcels). The WTRS Variant would include demolition of the same buildings as well as construction of the same shoreline improvements and transportation, utility, and open space networks as the Proposed Project. The WTRS Variant would not change any aspect of the Proposed Project related to demolition, excavation, and site grading; the construction of shoreline

[13] The San Francisco Eastside Recycled Water Project is in the planning stages, with construction not expected to be completed until the end of 2029. Information available online at http://sfwater.org/bids/projectDetail.aspx?prj_id=311. Accessed December 6, 2016.

[14] AECOM, Memorandum to Forest City, re: District-scale Wastewater Treatment and Reuse Project Summary, September 27, 2016, p. 3.

improvements; geotechnical stabilization; the construction of the transportation, open space, and utility infrastructure networks; or other improvements such as the construction of the new 20th Street pump station. Proposed development is expected to involve up to five phases (Phases 1 through 5) and is conceptual; however construction is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. As with the Proposed Project, the multi-phased approach to project site development would result in project site occupancy and operations overlapping with, and being affected by, future construction phases.

Proposed Land Use Programs

The WTRS Variant does not include any changes to the land use programs for the Maximum Residential Scenario or Maximum Commercial Scenario defined for the Proposed Project or the Proposed Project's wastewater and stormwater management options. The WTRS Variant would not result in any changes to the proposed open space network, traffic and circulation plan, new infrastructure and utility plans, geotechnical stabilization plan, or the shoreline improvement plan. See Chapter 2, Project Description, Table 2.2: Proposed Pier 70 Special Use District – Primary Uses by Parcel and Rehabilitated Building, p. 2.26. The land use program and project site improvements would be implemented in a similar fashion as that for the Proposed Project according to the timeline defined in the phasing.

Impact Evaluation

APPROACH TO ANALYSIS

The WTRS Variant would not involve any change to the mix of land uses, the space allocation of uses, or the residential unit count under the Maximum Residential Scenario and Maximum Commercial Scenario of the Proposed Project. Likewise, this variant would not involve any change to the locations, configurations, building envelopes, or excavation depths for the programmed development under the two scenarios analyzed for the Proposed Project. Therefore, physical environmental effects under this variant would be substantially the same as those identified for the Proposed Project for the following environmental topics: Population and Housing, Wind and Shadow, Recreation, Public Services, Biological Resources, Geology and Soils, and Agricultural and Forest Resources. All mitigation and improvement measures described for these topics under the Proposed Project would be applicable to this variant.

The following environmental topics are analyzed for this variant: Land Use and Land Use Planning, Cultural Resources (Archaeological Resources and Historic Architectural Resources), Transportation and Circulation, Noise and Vibration, Air Quality, Greenhouse Gas Emissions, Utilities and Service Systems, Hydrology and Water Quality, Hazards and Hazardous Materials, and Mineral and Energy Resources.

LAND USE AND LAND USE PLANNING

As noted above the WTRS Variant would not include any changes to the Maximum Residential or Maximum Commercial Scenarios defined for the Proposed Project. Under this variant the new 10,000-square-foot wastewater treatment collection facility may be developed in Building 108 or in a new building on the asphalt lot on the BAE Systems Ship Repair Site north of Parcels A and B and new 20th Street. The WTRS plant would be constructed as part of the first phase of development. As an infrastructure use, the WTRS plant within Building 108 or the new building on the adjacent asphalt lot would not be substantially different from other infrastructure features and related uses on the project site or its vicinity. The proposed WTRS plant would be consistent with the existing zoning on the BAE Systems Ship Repair site which is M-2 (Heavy Industrial) as well as the 65-X Height and Bulk District. The proposed use of Building 108 or the new building on the adjacent asphalt lot would be compatible with the adjacent land uses and would have less-than-significant land use impacts related to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.

Based on the above, project-level and cumulative land use and land use planning impacts under the WTRS Variant would be similar to those under the Proposed Project (see Section 4.B, Land Use and Land Use Planning). Implementation of the WTRS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

CULTURAL RESOURCES

Archeological Resources, Human Remains, and Tribal Cultural Resources

Under WTRS Variant there would be minimal excavation related to the rehabilitation of Building 108 or the construction of a new building on the adjacent lot because there would be no expansion to an existing basement level (if extant) at Building 108 or a new basement level in a new building on the adjacent asphalt lot. There would be no change to the depth and extent of excavation on the 28-Acre Site or the Illinois Parcels. As described in Section 4.D, Cultural Resources, the project site has been extensively altered over time resulting in low potential for prehistoric archeological resources. As further described, historic archeological resources such as subsurface architectural features related to the UIW Historic District, landscape features evidencing historic land uses, infrastructure features related to the former Union Iron Works/Bethlehem Steel industrial complex and associated industrial activities, refuse features related to Irish Hill habitation and industrial occupancies, and industrial features related to the various industries that have occupied the project site may be present on the project site. Although the potential for the discovery of historic archeological resources exists, the site history suggests that the rapid large-scale expansion of this area in response to the needs of World Wars I and II

constituted a series of actions more likely to have damaged or destroyed valuable archaeological resources, than to have left behind any new significant resources. However, as discussed under Impacts CR-1 and CR-2, the potential for encountering subsurface archeological resources, including human remains, cannot be conclusively ruled out, especially in those circumstances where excavation and grading would occur in previously undisturbed soils. Thus, as with the Proposed Project, with implementation of Mitigation Measures M-CR-1a: Archaeological Testing, Monitoring, Data Recovery and Reporting and M-CR-1b: Interpretation on pp. 4.D.25-4.D.29, the WTRS Variant would not cause a substantial adverse change to the significance of an archaeological resource, if present within the project site or the BAE Systems Ship Repair site.

The impacts of the WTRS Variant on tribal cultural resources would be substantially the same as those for the Proposed Project, i.e., less than significant (see Impact CR-3).

Historic Architectural Resources

The project site contains 11 contributors to the UIW Historic District (see Table 4.D.1: Contributing and Non-Contributing Buildings and Features on the Project Site, p. 4.D.35). The WTRS Variant would not include any changes to the Maximum Residential or Maximum Commercial Scenarios defined for the Proposed Project; or the plans for the preservation/rehabilitation/relocation of Buildings 2, 12, and 21; the demolition of Buildings 11, 15, 16, 19, 25, 32, and 66; the removal of the northern spur of the remnant of Irish Hill for construction of the new 21st Street; the transportation and open space network; the utility infrastructure; the public realm improvements; or the design principles identified in the *Pier 70 SUD Design for Development*.

Under the WTRS Variant, Building 108, which is identified as a contributor to the UIW District, may be rehabilitated and made structurally and seismically sound and venting for the odor control units would be introduced to the exterior of the structure, likely at the rooftop. These potential exterior and interior improvements to Building 108 would meet the *Secretary of Interior's Standards*. Therefore, the WTRS Variant would not alter the character-defining features of Building 108 or the relationship of Building 108 with other resources and the UIW Historic District as a whole and would not create a new impact. If the WTRS plant were to be constructed in a new building on the asphalt lot located adjacent to Building 108 the new building would be designed to be compatible with the UIW Historic District. As is the case for new infill construction under the Proposed Project (see Impact CR-11), Mitigation Measure M-CR-11: Performance Criteria and Review Process for New Construction (see pp. 4.D.103-4.D.106), would also be applicable to the WTRS Variant if the wastewater collection and treatment facility would be constructed as part of a new building rather than incorporated into rehabilitated Building 108. In addition, the land use program for the Proposed Project and the variant would be the same; thus, as with the Proposed Project, the impacts associated with the

demolition of historic resources, the rehabilitation of existing resources, and the construction of new buildings within and adjacent to the existing UIW Historic District and the remnant of Irish Hill would be less than significant or unchanged from that of the Proposed Project.

Therefore, the project-level and cumulative historic architectural resource impacts under the WTRS Variant would be the same as, or similar to, those discussed for the Proposed Project under Impacts CR-4 through CR-12 and Impact C-CR-2 in Section 4.D, Cultural Resources,. As with the Proposed Project, with implementation of Improvement Measures I-CR-4a: Documentation and I-CR-4b: Public Interpretation, on pp. 4.D.91-4.D.92, the less-than-significant impact related to the proposed demolition of seven contributing features would be reduced. Furthermore, as with the Proposed Project, with implementation of Mitigation Measures M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria and M-CR-11: Performance Criteria and Review Process for New Construction, on pp. 4.D.93-4.D.94 and pp. 4.D.103-4.D.106, the project-level and cumulative impacts of the relocation and rehabilitation of contributing features as well as the compatibility of new structures would be reduced so as not to cause a substantial adverse change to historic architectural resources.

Based on the above, project-level and cumulative cultural resource impacts under the WTRS Variant would be similar to those identified under the Proposed Project (see Section 4.D, Cultural Resources). Implementation of the WTRS Variant would not change the analysis or conclusions in that section, would not result in new or more severe impacts, and no new mitigation measures would be required.

TRANSPORTATION AND CIRCULATION

Demolition, excavation, site grading, and construction activities under the WTRS Variant would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project (see Figures 2.26 and 2.27 and Tables 2.5 and 2.6 on pp. 2.80-2.85). Under this variant the construction of the WTRS plant (in Building 108 on the BAE Systems Ship Repair site, or in a new building on the adjacent asphalt lot) would occur during the first phase of development. The associated collection and distribution pipeline system would emplaced within the public right-of-way at the same time as the construction of the proposed transportation and utility infrastructure networks and the adjacent Parcels. As a result there would be additional construction truck traffic trips associated with the construction of the WTRS plant and the installation of the WTRS infrastructure. As discussed under Impact TR-1 for the Proposed Project, the same construction truck traffic routes (e.g., Third Street and either 25th or Mariposa streets to access I-280 to travel south; Third Street and either Second or Fifth streets to reach the Bay Bridge and the East Bay; and Third Street, Howard Street, and Van Ness Avenue (U.S. 101) to travel to North Bay destinations) would be used under this variant. Implementation of the WTRS Variant would result in a slight increase in construction truck trips due to the need to

transport materials for the construction of the WTRS plant as well as associated equipment and pipelines; however, this increase would make up a relatively small portion of the construction truck traffic generated during each construction phase. Thus, construction-related impacts under this variant would be slightly greater than those for the Proposed Project, but would not result in an increase in severity of impacts or new significant impacts. The temporary (and less than significant) impacts associated with construction-related traffic of the Proposed Project are described under Impact TR-1, and that impact analysis would be applicable to this variant for the same reasons as stated for the Proposed Project (i.e., construction-related transportation impacts would be temporary and potential conflicts between construction activities and pedestrians, bicyclists, transit vehicles and auto vehicles, and between construction activities and nearby businesses and residents would be managed through City ordinances, regulations, and BMPs).

The WTRS Variant would not result in substantial increases in operational VMT because it does not alter the development scenarios for the Proposed Project. With respect to operational impacts, operational-related changes under this variant would be limited to the additional truck trips associated with the replenishment of the chemical storehouse at the WTRS plant (in Building 108 [or the new building on the adjacent asphalt lot]) as well as off-site hauling of trash and liquid waste (if not discharged to the sewer system). These combined activities would generate approximately two truck trips a week. The additional truck trips (and associated VMT increase) would be small in relation to the overall numbers of vehicle trips (and VMT) generated by the Proposed Project. Any increase in service truck trips (and associated VMT) would be small and would not substantially affect total vehicle miles traveled as a result of operations of the Proposed Project. Delivery of supplies for operation and maintenance of the WTRS plant would be similar to loading activities described for the Proposed Project, and would not substantially increase the demand for loading facilities. Emergency access would not be affected by the development of a WTRS plant in Building 108 on the BAE Systems Ship Repair site (or adjacent asphalt lot) because this infrastructure would not introduce any changes to the transportation network that would affect emergency access. The truck trips associated with the maintenance and operation of the WTRS plant under this variant (e.g., centralized activities as opposed to being dispersed throughout the project site) would change the circulation patterns on the project site but the change would be minimal. There would be minimal or no change to transit, pedestrian, or bicycle effects from the WTRS Variant. Thus, due to the minor increase in truck trips, operational-related project-level and cumulative transportation and circulation impacts under the WTRS Variant would be slightly greater than those discussed for the Proposed Project (see Section 4.E, Transportation and Circulation). Therefore, all operational-related mitigation measures identified under Section 4.E, Transportation and Circulation for the Proposed Project would also be applicable to the WTRS Variant (i.e., Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed [pp. 4.E.91-4.E.93] under Impact TR-5; Mitigation Measure M-TR-10: Improve pedestrian facilities on Illinois Street

adjacent to and leading to the project site [pp. 4.E.99-4.E.100] under Impact TR-10; Mitigation Measure M-TR-12a: The Project's Transportation Coordinator should coordinate with building tenants and delivery services to minimize deliveries during a.m. and p.m. peak periods [p. 4.E.105] under Impact TR-12; Mitigation Measure M-TR-12b: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed [p. 4.E.105] under Impact TR-12; Mitigation Measure M-C-TR-4a: Increase capacity on the 48 Quintara/24th Street bus route under the Maximum Residential Scenario [p. 4.E.118] under Impact C-TR-4; and Mitigation Measure M-C-TR-4b: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario [p. 4.E.118] under Impact C-TR-4). There would be no modifications to the below-grade parking program under this variant thus there would be no changes to the overall parking program under the Proposed Project.

Based on the above, project-level and cumulative transportation and circulation impacts under the WTRS Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.E, Transportation and Circulation). Implementation of the WTRS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

NOISE AND VIBRATION

Under the WTRS Variant construction-related noise and vibration would be generated by the same construction equipment as that for the Proposed Project and no additional or specialized equipment not previously identified in the Proposed Project would be required. Under this variant demolition, excavation, site grading, and construction activities would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. As discussed under Impact NO-2 in Section 4.F, Noise and Vibration, the multi-phased approach to project site development would result in the exposure of sensitive receptors (e.g., residential land uses on the Illinois Parcels – Parcels HDY1, HDY2, PKN, and PKS) to noise from active construction phase(s) and operational noise associated with the occupancy and operation of previously completed phases. Further, construction-related traffic increases from all new development on the project site would use the same roads (20th, new 21st, and new 22nd streets) to access the project site from Illinois Street, exposing the same sensitive receptors (those facing these streets on Parcels PKN, PKS, HDY, C2, F, and G) to construction traffic noise increases (over the 11 years of construction).

The noise associated with the construction of the proposed WTRS plant on the BAE Systems Ship Repair site (in Building 108 or in a new building on the adjacent asphalt lot) and placement of the associated pipeline system within the public rights-of-way along with all the other transportation and utility infrastructure would be similar to, or slightly greater than, that for the Proposed Project. Due to the minor increase in the number of construction truck trips under this

variant (i.e., materials delivery for the WTRS equipment and associated piping) the noise from construction truck traffic would be expected to be incrementally greater than that which would be generated under the Proposed Project. Thus, construction-related noise impacts under the WTRS Variant would be slightly greater than those for the Proposed Project, but the impacts would not be new impacts or substantially more severe than those identified under the Proposed Project. Therefore, as with the Proposed Project, the construction-related noise mitigation measures identified for the Proposed Project would be applicable to the WTRS Variant. As with the Proposed Project, construction-related truck trips generated during the estimated 11-year construction duration would be managed as part of the traffic control plan that would be developed for each of the construction phases, as delineated under Impact TR-1 in Section 4.E, Transportation and Circulation. The traffic control plans (that would be developed under Improvement Measure I-TR-A: Construction Management Plan) assume that construction vehicles would use Third Street and 25th Street or Mariposa Street to access I-280 to travel south; Third Street and either Second or Fifth streets to reach the Bay Bridge and the East Bay; and Third Street, Howard Street, and Van Ness Avenue (U.S. 101) to travel to North Bay destinations. As with the Proposed Project, and depending on the location of construction materials being transported to the project site and the location of the construction activities on the project site as well as the location of disposal sites for excavated soil and demolition debris, construction truck traffic under this variant would likely use the same streets.

Other than a slight increase in construction truck trips (for the rehabilitation of Building 108, construction of the WTRS plant, and installation of the associated piping) all other aspects of construction of the Proposed Project would be the same under the WTRS Variant. As described under Impacts NO-1 and NO-2 for the Proposed Project (see Section 4.F, Noise and Vibration), implementation of Mitigation Measure M-NO-1: Construction Noise Control Plan and Mitigation Measure M-NO-2: Noise Control Measures During Pile Driving would reduce the temporary or periodic increases in ambient noise levels, but these measures would not necessarily reduce these noise increases to below the significance threshold. Under the Proposed Project, the finding of a significant and unavoidable construction-related impact for the Proposed Project would be associated with the potential for pile driving for building foundations. Since the WTRS plant would not be expected to need a pile foundation, the WTRS Variant would not contribute to this significant noise impact. However, construction-related noise impacts under the WTRS Variant would be the same as the Proposed Project – significant and unavoidable. Therefore, as with the Proposed Project, the construction-related noise mitigation measures identified for the Proposed Project would be applicable to the WTRS Variant.

The proposed WTRS plant would be developed on the BAE Systems Ship Repair site north of Parcels A and B and may be located in either Building 108 or an adjoining asphalt lot. Noise generated by the operation of the WTRS plant would be contained within a structure, which

would limit the potential for exposure of Proposed Project residents to operational noise from this facility. Additionally, the potential for noise impacts on these residents would be further limited by proposed location of the WTRS plant, which would be at least 400 feet from the closest future residential receptors and the presence of intervening commercial buildings (Parcels A and B) between the WTRS plant and these residents. Given these factors, it is expected that compliance with noise limits specified in Section 2909 of the Police Code would be sufficient to ensure thatoperation of the proposed WTRS plant would not result in any new significant noise impacts beyond those identified for the Proposed Project. However, under this variant, unlike the Proposed Project, truck trips associated with the replenishment of chemical storehouses at the proposed WTRS facility and off-site hauling of trash and liquid waste (about two truck trips per week) would incrementally add to traffic noise increases estimated for the Proposed Project, some of which were determined to be significant and unavoidable with mitigation and cumulatively considerable. However, this minor increase would not measurably change estimated average daily traffic noise increases. Therefore, operational-related, project-level, and cumulative noise impacts under the WTRS Variant would be the same as those discussed for the Proposed Project, i.e., significant and unavoidable with mitigation (see Section 4.F, Noise and Vibration). Thus, all operational-related mitigation measures identified for the Proposed Project would also be applicable to the WTRS Variant.

Based on the above, project-level and cumulative noise and vibration impacts under the WTRS Variant would be similar to those identified under the Proposed Project (see Section 4.F, Noise and Vibration). Implementation of the WTRS Variant would not change the analysis or conclusions in that section, would not result in new or more severe impacts, and no new mitigation measures would be required.

AIR QUALITY

Under the WTRS Variant construction-related air quality emissions would be generated by the same construction equipment as that for the Proposed Project. Under this variant demolition, excavation, site grading, and construction activities would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. As with the Proposed Project, the multi-phased approach to project site development would result in simultaneous emissions from active construction phase(s) and the occupancy and operation of previously completed Phases (e.g., the residential land uses on the Illinois Parcels – Parcels HDY1, HDY2, PKN, and PKS). Due to the construction of the WTRS facility on the BAE Systems Ship Repair site and the installation of the associated collection and distribution pipeline systems, the number of construction vendor trips under this variant would be slightly greater than those under the Proposed Project. Under the WTRS Variant the construction truck traffic component of emissions of criteria air pollutants during the various construction phases would be slightly

greater than that which would be generated under the Proposed Project. Thus, construction-related air quality impacts under the WTRS Variant would be slightly greater than those for the Proposed Project. Therefore, Mitigation Measure M-AQ-1a: Construction Emissions Minimization, pp. 4.G.42-4.G.44, identified for the Proposed Project, would be applicable to the WTRS Variant.

Under this variant, unlike the Proposed Project, a WTRS plant would be constructed. The WTRS Plant would be located north of the project site on the BAE Systems Ship Repair site within rehabilitated Building 108 or a new building on the adjacent asphalt lot. The WTRS plant would require permits from the BAAQMD that would place conditions on emissions and annual operations. Emissions of criteria air pollutants generated by the operation of the proposed WTRS Variant would add to emissions estimated for the Proposed Project. Further, under this variant, unlike the Proposed Project, truck trips associated with the replenishment of chemical storehouses at the WTRS plant and off-site hauling of trash and liquid waste (about two truck trips per week) would be new mobile sources of emissions. The slight increase in truck trips (less than one trip per day) would not result in a meaningful increase in emissions over the Proposed Project under either development scenario, both of which would generate over 30,000 trips per day. Based on the designed throughput of the WTRS plant, its operational stationary source emissions would be less than 0.02 percent of the existing operational criteria pollutant emissions of the City's existing Southeast Treatment Plant. This would equate (based on BAAQMD's most recent inventory published in 2014) to approximately 0.01 tons per year ROG and 0.01 tons per year of NOx. Thus, while the operation of the WTRS plant and the incremental increase in truck traffic under the WTRS Variant would result in a slight increase in operational emissions of criteria air pollutants over that estimated for the Proposed Project this increase would not change the estimate of daily or annual emissions reported in Section 4.G, Air Quality. The WTRS plant would likely be developed as part of Phase 1 and become operational upon completion and occupancy of the first residential buildings under Phases 2 through 5. Its operational capacity would increase with each new building that would be developed and connected to the associated pipeline systems. As shown in Tables 4.G.7 and 4.G.8, pp. 4.G.38-4.G.39 and 4.G.54-4.G.55, for the Proposed Project, construction-related emissions during the concurrent construction of Phases 1 and 2 would be less than significant. However, the combined emissions from Phase 3 construction and the occupancy and operation of Phases 1 and 2; from Phase 4 construction and the occupancy and operation of Phases 1 through 3; and from Phase 5 construction and the occupancy and operation of Phases 1 through 4 would exceed the significance thresholds for certain criteria air pollutants. Thus, as with the Proposed Project, under this variant the combined criteria pollutant emissions generated during a construction phase and the occupancy and operation of a previously completed phase(s) would result in significant air quality impacts.

Operational-related air quality impacts under the WTRS Variant would not be meaningfully greater than the impacts of the Proposed Project, i.e., significant and unavoidable (see Section 4.G, Air Quality). Thus, as with the Proposed Project, operational-related mitigation measures identified for the Proposed Project would also be applicable to the WTRS Variant.

Under the WTRS Variant, as with the Proposed Project, TAC emissions from construction and occupancy and operation would expose sensitive receptors to substantial pollutant concentrations of TACs and result in a localized health risk. Under this variant the exposure of sensitive receptors to substantial pollutant concentrations of TACs would be slightly increased as a result of emissions from additional construction truck trips, the operation of the WTRS plant, and the truck trips needed to service and maintain the WTRS plant, and, as with the Proposed Project, would result in a significant impact. TAC emissions from operation of the WTRS plant would likely primarily be the result of backup diesel generators, which would require a permit from the BAAQMD. Other TAC emissions associated with water treatment facilities are primarily the result of cogeneration engines, sludge handling processing, anaerobic digesters, waste gas flares, and boilers, none of which would be part of the WTRS Variant, as currently proposed. The BAAQMD will not issue a permit for a source that exceeds a health risk of 10 in one million. The maximum cumulative increased cancer risk for the Proposed Project would be 86 in one million, as indicated in Section 4.G, Air Quality, Table 4.G.16. Conservatively, assuming a worst case increase of 10 in one million associated with addition of backup generator operations for the WTRS, the maximum cumulative increased cancer risk for the Proposed Project would be 96 in one million, which would still be below the 100 in one million threshold and therefore still a less-than-significant impact.

As discussed under Impact AQ-3, the exposure of on-site sensitive receptors to increased TAC emissions from construction equipment as well as stationary sources (e.g., diesel back-up generators) would be reduced to a less-than-significant level with implementation of Mitigation Measures M-AQ-1a: Construction Emissions Minimization and M-AQ-1b: Diesel Backup Generator Specifications. These mitigation measures would be applicable to the WTRS Variant ensuring that implementation of the WTRS Variant would also be less-than significant with mitigation.

As with the Proposed Project, the WTRS Variant would be consistent with the 2010 Clean Air Plan, and impacts would be less than significant with implementation of the TDM Plan (see "TDM Plan," in Section 4.E, Transportation and Circulation, pp. 4.E.46-4.E.47), which includes strategies to discourage the use of automobiles and encourage transit and other modes of transportation. Other mitigation measures of the Proposed Project, identified under Impact AQ-1, that would also be applicable to the WTRS Variant in regards to consistency with the 2010 Clean Air Plan are as follows:

- Mitigation Measure M-AQ-1a : Construction Emissions Minimization Plan (requiring low NOx emitting construction vehicles; requiring Tier 4, low-emissions construction vehicles),
- Mitigation Measure M-AQ-1b: Diesel Backup Generator Specifications (reducing NOx associated with operation)
- Mitigation Measure M-AQ-1f: Transportation Demand Management,
- Mitigation Measure M-AQ-1g: Additional Mobile Source Control Measures (preferential parking and/or charging stations for fuel-efficient vehicles and a neighborhood electric vehicle program), and
- Mitigation Measure M-AQ-1h: Emissions Offset of Operational Emissions (implement replacement or repair of high-emitting vehicles).

Thus, as with the Proposed Project, the implementation of the TDM strategies and mitigation measures would ensure the project includes relevant transportation control measures specified in the Clean Air Plan (see Impact AQ-4). The TDM Plan and mitigation measures would be applicable to the WTRS Variant ensuring that implementation of the WTRS Variant would also be less-than significant with mitigation.

As noted above, odor control units would be installed at the WTRS plant with venting to occur at the rooftop of rehabilitated Building 108 or a new standalone structure on the BAE Systems Ship Repair site north of Parcels A and B. Since the WTRS plant would use electrical power and chemicals there would be no methane-related odors. Furthermore, the handling of hazardous materials such as the chemicals used for the various treatment and processing steps including liquid waste would be conducted in accordance with the required Hazardous Materials Business Plan as well as Regulation 7 of the BAAQMD which places general limitations on odorous substances and specific emission limitations on certain odorous compounds; thus, ensuring that potential odors associated with this activity would be reduced to the maximum extent possible. Thus, as with the Proposed Project, the impacts of the WTRS Variant related to the creation of objectionable odors that would affect a substantial number of people would be less than significant (see Impact AQ-5).

Based on the above, project-level and cumulative air quality impacts under the WTRS Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.G, Air Quality). Implementation of the WTRS Variant would not result in new or substantially more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

GREENHOUSE GAS EMISSIONS

A variety of controls are in place to ensure that development in San Francisco would not impair the State's ability to meet Statewide GHG reduction targets outlined in AB 32, nor impact the

City's ability to meet San Francisco's local GHG reduction targets. Projects that are consistent with San Francisco's GHG Reduction Strategy would not contribute significantly to global climate change. Similar to the Proposed Project, the WTRS Variant would be required to comply with these regulations and requirements that reduce GHG emissions (see Table 4.H.2: Regulations Applicable to the Proposed Project, in Section 4.H, Greenhouse Gas Emissions, pp. 4.H.13-4.H.28). Since the WTRS Variant would comply with GHG reduction measures required in various City ordinances and would be consistent with all the regulations applicable to the Proposed Project, it would comply with San Francisco's Greenhouse Gas Reduction Strategy. Therefore, as with the Proposed Project, the WTRS Variant would have a less than cumulatively considerable contribution to significant cumulative GHG impacts.

Implementation of the WTRS Variant would result in an incremental increase in construction truck trips over that for the Proposed Project due to construction of the WTRS plant and materials delivery, i.e., equipment and associated piping system. Thus construction activities under this variant that would result in GHG emissions would be slightly greater than those for the Proposed Project.

As with the Proposed Project, this variant would introduce a mixed-use development in an area that is served by public transit, and would include Class I and Class II bicycle parking spaces, energy efficiency features beyond Title 24 requirements, low-impact stormwater management design, water-efficient landscaping, water-conserving interior design, convenient recycling and composting, street trees, and other features consistent with San Francisco's requirements. However, operation of WTRS plant would slightly alter GHG emissions from the Proposed Project because the plant would use energy in the treatment process to meet non-potable water requirements, however increases in emissions would be minimal since the amount of wastewater treatment processing at the off-site Eastside Recycled Water Program would be reduced under the WTRS variant due to the proposed on-site wastewater treatment.

Similar to the Proposed Project, development would be consistent with the Sustainable Communities Strategy by including residential and commercial uses in a designated Priority Development Area per Plan Bay Area, furthering the region's goals for reducing GHG emissions. Implementation of local GHG reduction requirements would substantially reduce a project's GHG emissions. Furthermore, as described in Section 4.H, Greenhouse Gas Emission, implementation of air quality mitigation measures would also have the added benefit of further reducing GHG emissions from the Proposed Project. Mitigation Measures M-AQ-1a through M-AQ-1h, shown in Section 4.G, Air Quality, pp. 4.G.42-4.G.51, would help reduce emissions of GHGs through the reduction in construction emissions; limitations on diesel generators; use of low VOC architectural coatings and green consumer products; electrification of loading docks; encouragement of the use of transit and non-motorized modes of transportation; and emission

offsets. These mitigation measures would also be applicable to the WTRS Variant and would further reduce this variant's less-than-significant GHG emissions.

Based on the above, GHG impacts under the WTRS Variant would be similar to those identified under the Proposed Project (see Section 4.H, Greenhouse Gas Emissions). Implementation of the WTRS Variant would not result in new or substantially more severe impacts and would not change the analysis or conclusions in that section.

UTILITIES AND SERVICE SYSTEMS

As described above, under this variant the WTRS plant would be constructed as part of the first construction phase and would be located either within the rehabilitated Building 108 or an adjacent asphalt lot on the BAE Systems Ship Repair site north of Parcels A and B. The associated wastewater collection pipelines and treated water distribution pipelines would be constructed to connect each of the buildings served to the WTRS plant.

As discussed under Impact UT-1, the total average potable water demand for the Proposed Project at full build out would be 0.51 mgd under the Maximum Residential Scenario and 0.44 mgd under the Maximum Commercial Scenario. The SFPUC confirmed that this amount of potable water is available from its regional water system in its adopted Water Supply Assessment for the Proposed Project.[15] The WTRS Variant includes the same development scenarios as the Proposed Project (Maximum Residential Scenario and Maximum Commercial Scenario), therefore the potable water demand under this variant would be the same as the Proposed Project.

Under the Proposed Project, the use of potable water would be offset by using non-potable water derived from graywater and rainwater for non-potable purposes such as toilet and urinal flushing, landscape irrigation, and cooling tower make-up water in accordance with the City's Non-potable Water Ordinance; the total non-potable demand would be 0.13 mgd for the Maximum Residential Scenario and the total non-potable demand for the Maximum Commercial Scenario would be 0.15 mgd. The WTRS Variant would utilize blackwater, in addition to graywater and rainwater, to help meet this demand in compliance with the City's Non-potable Water Ordinance. However, this variant would not result in further reductions in the potable water demand relative to the Proposed Project because all of the non-potable demands can already be met by graywater and rainwater. Therefore, impacts related to having a sufficient water supply for the WTRS Variant would be the same as those for the Proposed Project (see Impact UT-1). Similarly, impacts related to the need for new or expanded water distribution systems would be the same as for the

[15] City and County of San Francisco Public Utilities Commission, *Resolution No. 16-0095 approving May 24, 2016 Water Supply Assessment for the Pier 70 Project*, May 24, 2016.

Proposed Project (see Impact UT-2). Thus, both impacts would be less than significant for this variant.

Under the Proposed Project at full build out, the maximum average dry-weather wastewater flows would be 0.48 mgd under the Maximum Residential Use Scenario and 0.41 mgd under the Maximum Commercial Use Scenario.[16] The sewer demand would be the same for the WTRS Variant because the estimates for the Proposed Project assume compliance with the City's Non-potable Water Ordinance. As discussed in Impact UT-3, this sewer demand is well within the capacity of the SEWPCP, and impacts related to exceeding the wastewater treatment requirements of the SEWPCP would be less than significant for this variant as it would be for the Proposed Project. Under the WTRS Variant, as with the Proposed Project, dry-weather sewer demand for both the Maximum Residential Scenario and Maximum Commercial Scenario is greater than the remaining dry weather capacity of the 20th Street pump station by approximately 0.3 mgd and 0.1 mgd, respectively. To address this, the WTRS Variant includes construction of the same wastewater conveyance system improvements as the Proposed Project, including the new 20th Street pump station and associated pipelines, as well as the relocated 54-inch detention line connecting the 20th and 22nd streets CSD outfall structures. Therefore, impacts related to requiring new or expanded wastewater treatment facilities and impacts related to resulting in a determination by the SFPUC that it has inadequate capacity to serve the Proposed Project's estimated demand in addition to its existing commitments would be less than significant. These impacts would be the same as those of the Proposed Project (see Impact UT-4).

The WTRS Variant would include construction of the same buildings and result in the same small increase in impervious surfaces as the Proposed Project. Therefore, the volume and rate of stormwater runoff from the project site under this variant would be the same as would occur under the Proposed Project. The WTRS Variant would be subject to the same regulatory requirements as under the Proposed Project and would not require the construction of new or expanded stormwater facilities. The impact would be less than significant regardless of the wastewater and stormwater management option implemented (see Impact UT-5).

As discussed above, operation of the WTRS plant would result in the capture/screening out of liquid waste and other debris. Although liquid waste could be discharged to the combined sewer system or separate wastewater system, depending on which option is implemented by the project sponsors, this assessment assumes that all solid waste (e.g., trash) and liquid waste that would be generated as a result of the three-step wastewater treatment processes would require off-site disposal at an appropriate landfill or transport to a treatment facility. Since the two scenarios defined for the Proposed Project would not change under the WTRS Variant the volume of solid

[16] BKF, *Pier 70 Sewer Demand Memorandum*, March 29, 2016.

waste (either trash, recyclables, or compostables) generated on the project site under this variant would be the same as that from the Proposed Project. Including the addition of trash screened out at the WTRS plant the overall amount of solid waste that would need to be transported to appropriate landfills would be similar to that under the Proposed Project. Unlike the Proposed Project wherein liquid waste would be collected and transported via the combined sewer system to the SEWPCP, under the WTRS Variant liquid waste would be captured and retained on site for a period of time (thus reducing their yield) prior to transport for final treatment. Therefore, solid waste-related impacts of the WTRS Variant would be substantially the same as those for the Proposed Project, and, similar to the Proposed Project, the WTRS Variant would comply with all local, State, and Federal statutes related to solid waste (see discussion under Impacts UT-6 and UT-7).

Based on the above, project-level and cumulative utilities and service systems impacts under the WTRS Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.K, Utilities and Service Systems). Implementation of the WTRS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

HYDROLOGY AND WATER QUALITY

The WTRS Variant includes construction of new wastewater collection lines and treated water distribution lines between the WTRS plant and the buildings served. The development footprint of the variant is identical to the Proposed Project (except for the new WTRS plant on a location north of Parcels A and B on the BAE Systems Ship Repair site). The WTRS plant would be located in a building that would have a footprint of no more than 10,000 square feet resulting in an incremental increase in the total volume of excavated soils. Installation of the additional pipelines would occur within the public right-of-way in tandem with the development of adjacent parcels and associated transportation and utility infrastructure improvements. Thus, construction of the WTRS plant and associated pipeline systems would not substantially affect the amount of excavation required for project construction or the amount of construction-related dewatering required.

As with the Proposed Project, impacts related to a violation of water quality standards or waste discharge requirements and degradation of water quality during construction under this variant would be less than significant with compliance with applicable regulatory requirements. Regulatory requirements for on-land construction activities include the SWRCB Construction General Stormwater Permit and the associated Stormwater Pollution Prevention Plan as well as Article 4.2 of the San Francisco Public Works Code and the associated Construction Site Runoff Permit, depending on the wastewater and stormwater management implemented (see discussion under Impact HY-1).

As described under Impact HY-1, groundwater discharges during construction-related excavation dewatering could be discharged to the combined sewer system in accordance with the requirements of Article 4.1 of the Public Works Code, as supplemented by Order No. 158170. Alternatively, the groundwater could be discharged directly to San Francisco Bay in accordance with a NPDES permit from the Regional Water Quality Control Board, such as the Groundwater General Permit, the VOC and Fuel General Permit, or an individual NPDES permit. As with the Proposed Project, the WTRS Variant would adhere to the construction-related permit requirements for groundwater discharges described in Impact HY-1, thus ensuring that construction-related water quality impacts would be less than significant.

As for the Proposed Project, implementation of Article 4.2 of the San Francisco Public Works Code Section 147 and the Stormwater Control Plans required under the City's Stormwater Management Requirements and Design Guidelines would ensure that construction under the WTRS Variant would not cause alterations or diversions of existing streams or water courses, or changes to existing drainage patterns such that substantial erosion, siltation, or flooding would occur on or off site (see Impact HY-4). As with the Proposed Project, impacts under the WTRS Variant related to alteration of existing drainage patterns would be less than significant.

The WTRS Variant would not change the amount of stormwater runoff that would drain from the project site. Therefore, operational impacts related to stormwater discharge would be less than significant, as for the Proposed Project, and the same regulatory requirements would apply (see Impact HY-2).

This variant would reduce the amount of wastewater discharged to the sewer system by using some of the treated water for landscape irrigation. Therefore, it would have the same or reduced water quality effects from CSDs as those for the Proposed Project. However, the reduction in wastewater volume is not expected to be sufficient to avoid exceeding the capacity of the 20th Street pump station at least during wet weather. As with the Proposed Project, without sufficient pumping capacity the new pump station could cause the frequency of CSDs from the 20th Street sub-basin and/or downstream basins to increase beyond the long-term average of 10 CSD events per year, in violation of the Bayside NPDES permit. Therefore, as with the Proposed Project, a significant water quality impact would also occur under the WTRS Variant. Thus, implementation of mitigation measures identified for the Proposed Project would also be applicable to the WTRS Variant. Mitigation Measures M-HY-2a or M-HY-2b on pp. 4.O.60-4.O.61 would be required to ensure that wastewater and stormwater discharges would not exceed the long-term average of 10 CSD events specified in the Bayside NPDES permit for the 20th Street sub-basin and downstream basins of the combined sewer system.

Unlike the Proposed Project, the WTRS Variant would use blackwater as an alternate water supply to comply with the City's Non-potable Water Ordinance. As mentioned previously, blackwater includes biological wastes from toilets, urinals, dishwashers, kitchen sinks, and utility sinks that contain feces, urine, and other bodily wastes. Blackwater contains higher amounts of microorganisms than graywater, which is typically derived from bath tubs, showers, bathroom sinks, and clothes washing machines. Higher amounts of microorganisms could result in greater health risks to site users. However, in accordance with the City's Non-potable Water Ordinance, the project sponsors or private operator would be required to treat the blackwater to comply with the non-potable water quality criteria specified by the DPH and conduct monitoring to demonstrate compliance with the specified non-potable water quality criteria. For blackwater reuse systems, the treated water must meet specified water quality limits for total coliform, biochemical oxygen demand, and total suspended solids, in addition to meeting other water quality criteria applicable to graywater reuse systems. Further, the blackwater system operators must hold a Level II, or higher, certification as a wastewater treatment plant operator as specified in the DPH Rules and Regulations. Although there is a higher potential for health risks due to use of blackwater as an alternate water supply under the WTRS Variant, impacts related to reuse of blackwater would be less than significant with implementation of the requirements of the City's Non-potable Water Ordinance, similar to the Proposed Project.

As with the Proposed Project, the WTRS Variant would not result in depletion of groundwater resources because, other than the pumping of groundwater during construction dewatering, this variant would not involve the use or extraction of groundwater. Rather, as with the Proposed Project, potable water would be provided by the SFPUC, and non-potable water would be obtained from various sources in accordance with the City's Non-potable Water Ordinance. Further, this variant would not interfere with groundwater recharge because the change in impervious surfaces would be the same as would occur under the Proposed Project (see Impact HY-3). Therefore, under this variant, as with the Proposed Project, impacts related to depletion of groundwater resources and interference with groundwater recharge would be less than significant.

Under the WTRS Variant there would be no change to the Proposed Project's shoreline improvements; thus, impacts related to existing flooding, future flooding, and tsunami inundation would be less than significant, as for the Proposed Project.

Based on the above, project-level and cumulative hydrology and water quality impacts under the WTRS Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.O, Hydrology and Water Quality). Implementation of the WTRS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

HAZARDS AND HAZARDOUS MATERIALS

The WTRS Variant includes construction of the new WTRS plant and the new wastewater collection lines and treated water distribution lines within the public right-of-way between the WTRS plant and the buildings served. Construction of the WTRS plant and the additional pipelines would not substantially change the amount of soil excavation required for project construction, and would only introduce one new area of excavation (the location of the WTRS plant on the BAE Systems Ship Repair site). The WTRS Variant would include essentially the same amount of construction as would occur under the Proposed Project. Therefore, the use of hazardous materials during construction and the volume of groundwater dewatering would be the same as for the Proposed Project and would be less than significant with implementation of an erosion and sediment control plan in accordance with Article 4.2 of the San Francisco Public Works Code or a SWPPP in accordance with the SWRCB Construction General Stormwater Permit (see Impact HZ-1).

In addition to the same use of hazardous materials and generation of hazardous waste during operation as the Proposed Project, this variant would require the use of sodium hydroxide, a membrane cleaning acid (if membranes are used in the advance treatment system), and an oxidizing agent such as sodium hypochlorite. As for the Proposed Project, the use, storage and management of hazardous materials and wastes in accordance with Articles 21 and 22 of the San Francisco Health Code would ensure that impacts related to the routine use, transport, and disposal of hazardous materials during operation would be less than significant. Impacts under the WTRS Variant would be substantially the same as those discussed for the Proposed Project (see discussions under Impact HZ-1).

The WTRS Variant would not change demolition and renovation activities on the 28-Acre Site; however, it may include the rehabilitation of Building 108. However, the same regulatory requirements related to demolition and disposal of hazardous building materials would apply, and the impact would be less than significant (see Impact HZ-2). As with the Proposed Project, significant impacts related to the removal of PCB-containing electrical transformers would occur under this variant. Thus, the mitigation measures identified for the Proposed Project (Mitigation Measures M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers, M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed, and Mitigation Measure M-HZ-2c: Conduct Soil Sampling if Stained Soil is Observed) would be applicable to this variant and would ensure that impacts would remain less than significant.

The WTRS Variant would involve excavation of a similar quantity of soil as the Proposed Project. Thus, under this variant, impacts related to exposure of the public and workers to chemicals in the soil and groundwater during construction would be less than significant with implementation of mitigation measures identified for the Proposed Project (see discussion under

Impacts HZ-3 and HZ-4). The WTRS Variant would also have the same potential to damage existing groundwater monitoring wells and generate naturally-occurring asbestos dust during construction. Thus, implementation of mitigation measures identified for the Proposed Project would ensure that the impacts associated with exposure to these emissions would remain less than significant under this variant. Further, diesel particulate matter emissions from construction would be the same as or similar to the Proposed Project and would continue to be less than significant (see Impact HZ-8).

Impacts related to the potential to interfere with PG&E's remediation of the PG&E responsibility area and exposure to chemicals in the soil within the Hoedown Yard during operation would be substantially the same as those discussed for the Proposed Project because there would be no change to the interface of the 28-Acre Site and adjacent land uses to the south (see discussions under Impact HZ-5 and Impact HZ-7). As for the Proposed Project, these impacts would be less than significant with implementation of Mitigation Measures M-HZ-5: Delay Development on Parcel H2 Until Remediation of the PG&E Responsibility Area is Complete and M-HZ-7: Modify Hoedown Yard Site Mitigation Plan. As for the Proposed Project, the development of residential uses on Parcel H1 would expose future residents to the potential for adverse health effects due to vapor intrusion; however, implementation of Mitigation Measure M-HZ-6: Additional Risk Evaluations and Vapor Control Measures for Residential Land Uses would ensure that impacts to residential users would be less than significant. The mitigation measures identified for the Proposed Project would remain applicable to the WTRS Variant.

Because land uses would be the same under this variant, including the development and future use of the Irish Hill Playground, impacts from naturally-occurring asbestos would be the same as under the Proposed Project. Thus, with implementation of the mitigation measures identified for the Proposed Project the impacts under this variant would be reduced to less-than-significant levels (see discussion under Impact HZ-8).

Based on the above, project-level and cumulative hazards and hazardous materials impacts under the WTRS Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.P, Hazards and Hazardous Material). Implementation of the WTRS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures are required.

MINERAL AND ENERGY RESOURCES

Environmental impacts associated with mineral and energy resources under the WTRS Variant would be the same as or similar to the environmental impacts addressed in Section 4.Q, Mineral and Energy Resources, for the Proposed Project. The variant would have no impact on mineral

resources, consistent with the Proposed Project as addressed in Impact ME-1. Demolition, excavation, site grading, and construction activities under the WTRS Variant would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project (see Figures 2.26 and 2.27 and Tables 2.5 and 2.6, pp. 2.80-2.85). As described above, under this variant the construction of the WTRS plant would occur as part of the first phase of development. Construction of the associated collection and distribution pipeline system would occur according to the phase associated with the adjacent Parcels and would occur in concert with other infrastructure improvements. Implementation of the WTRS Variant would result in a slight increase in construction truck trips due to the need to transport materials for the construction of the new facility and associated pipeline system. Due to the increased fuel usage for the additional construction truck trips, construction-related energy impacts under this variant would be slightly greater than those for the Proposed Project. However, as with the Proposed Project, energy impacts under this variant would be less than significant because construction-related activities would be temporary.

Under the WTRS Variant, unlike the Proposed Project, a WTRS plant may be located either in Building 108 or on an adjacent asphalt lot on the BAE Systems Ship Repair site immediately north of the 28-Acre Site. Under this variant, operational-related changes associated with the WTRS plant would be expected to use the same amount of electricity, natural gas, and transportation fuel as that estimated for the Proposed Project for the reasons discussed further below (see Tables 4.Q.1 and 4.Q.2, pp. 4.Q.15-4.Q.19). Under the WTRS Variant the collection of blackwater (in addition to graywater and rainwater under the Proposed Project), its treatment, and its subsequent distribution for on-site reuse would result in increased energy usage. Under the WTRS Variant, the two truck trips per week needed to replenish the chemical storehouse as well as truck trips for the transport of liquid waste to an appropriate treatment facility and for the transport of debris screened out as part of the wastewater treatment process to a landfill would result in a slight increase in the use of transportation fuel.

As described below, these slight increases in energy usage would be offset by energy savings in other areas. Under the WTRS Variant, unlike the Proposed Project, the inclusion of blackwater to the proposed on-site water capture mix (i.e., graywater and rainwater under the Proposed Project) would result in a slightly greater reduction in wastewater flows emanating from the project site and a commensurate reduction in the energy required to collect and treat that flow prior to discharge. Furthermore, blackwater capture under this variant, unlike the Proposed Project, would increase the amount of non-potable water that would be available to meet future on-site non-potable water demand thus reducing overall potable water demand and the energy required for its collection, treatment, and distribution. Thus, under this variant, the slight increase in energy consumption for operation of the WTRS plant and the truck trips needed to service the WTRS plant would likely be offset by an incremental decrease in the use of energy related to the

energy-intensive systems that collect, treat, and deliver municipal water and wastewater. Additionally, implementation of this variant would result in a reduction in potable water use. Therefore, environmental impacts associated with energy resources under the WTRS Variant would be the same as, or similar to, the environmental impacts addressed in Section 4.Q, Mineral and Energy Resources, for the Proposed Project. Implementation of the WTRS Variant would not require the construction of new, or the expansion of, existing electric or natural gas transmission/distribution facilities (see discussions under Impacts ME-2 and ME-3).

Based on the above, project-level and cumulative mineral and energy impacts under the WTRS Variant would be similar to those identified under the Proposed Project (see Section 4.Q, Mineral and Energy Resources). Implementation of the WTRS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no mitigation measures would be required.

D. AUTOMATED WASTE COLLECTION SYSTEM VARIANT

Introduction

An AWCS Variant is under consideration by the project sponsors because it has the potential to operate more efficiently and reduce the number of trash collection truck trips and the associated noise. The AWCS Variant is an infrastructure-related variant. It would replace the proposed system of collecting and transporting recyclables, compostables, and trash (i.e., collection trucks that would drive around the project site to pick up solid waste from each individual building) with a central waste collection facility, loading stations for the collection of solid waste, and a subsurface pipeline system for the transport of solid waste from the loading stations to the central waste collection facility. The central waste collection facility would be up to 10,000 square feet and up to 35 feet in height. It would be located outside of the project site on land north of Parcel B on the BAE Systems Ship Repair site (a surface parking lot) and would likely be constructed as part of the first phase of development. The subsurface pipeline system would be constructed at the same time as the proposed transportation and utility infrastructure networks. There would be loading stations in each new and rehabilitated building as well as in the public right-of-way and in the proposed open spaces. Loading stations located within the new and rehabilitated buildings and public areas would connect to the subsurface pipeline system and become operational upon completion of the building and segments of the transportation and utility infrastructure networks.

The AWCS Variant does not include any changes to the land use programs for the Maximum Residential Scenario or Maximum Commercial Scenario defined for the Proposed Project. As a result, the AWCS Variant would not alter the amount of solid waste estimated to be generated by the future residents, workers, and visitors for the Proposed Project. The land use programs and

project site improvements would be implemented in a similar fashion as that for the Proposed Project.

Description

The AWCS would be designed to accept recyclables, compostables, and trash at separate loading stations in buildings and public areas. These waste streams would then be transported through a subsurface pipeline system to a central waste collection facility. In order to minimize the potential for odors from organic decomposition and other odorous waste, the subsurface pipeline system would be designed to be under negative pressure (i.e., vacuum towards the central waste collection facility) and activated carbon filters would be used to eliminate odors at the system exhaust.

Under the AWCS Variant, residents, workers, and visitors would deposit recyclables, compostables, and trash in designated receptacles both within and outside of buildings. Once deposited, the material would be temporarily stored at the loading point. A sensor would initiate the discharge sequence when the level of solid waste reaches the capacity of the temporary storage space or it would be initiated according to a predetermined schedule so as to minimize the potential for organic material in the system to linger long enough to produce objectionable odors. The pneumatic system with an air stream of up to 60 miles per hour would direct the solid waste through the subsurface pipeline system to the central waste collection facility. Once the recyclables, compostables, and trash reach the central waste collection facility, each type of material would be collected and compacted before being loaded into trucks and hauled to an off-site processing facility. The project sponsors estimate that solid waste collected at this facility would generate one truck trip per day for off-site hauling of solid waste.

The central waste collection facility would be located in the vicinity of the new 20th Street pump station on the BAE Systems Ship Repair site north of the proposed commercial office uses on Parcels A and B. The proposed facility would have a footprint of approximately 5,000 square feet and could be developed on a single level or on two levels. The central waste collection facility would house the suction equipment fans and air compressors, air scrubbers, waste separators, compactors, and containers for temporary storage. The air scrubbers would be wet scrubbers designed and operated to remove airborne particulates and exhaust from the facility. Water from the wet scrubbers would be recycled within the scrubbers. When the scrubbers need to be replaced, the water would be filtered and then discharged to the wastewater collection system in accordance with applicable regulatory requirements. No hazardous materials would be used in the operation of the central waste collection facility or associated odor control system. Sound insulation would be provided around the fan and/or collection area to minimize ambient

noise from the facility. The operator of the collection facility could reduce potential fan noise to 85 decibels[17] or less with acoustical treatments on walls and ceilings, and silencers or other noise-dampening methods on the exhaust pipe. Additional noise shielding would be installed as necessary to achieve the compliance standards of the San Francisco Noise Ordinance.

PROPOSED CONSTRUCTION PHASING

Under the AWCS Variant, demolition, excavation, site grading, and construction activities would be conducted according to the construction phases described in Chapter 2, Project Description, and would be substantially the same as under the Proposed Project. Under both the Maximum Residential Scenario and Commercial Scenario the AWCS facility would be constructed as part of Phase 1. Under either scenario, the associated subsurface pipeline system would be constructed according to the construction phases detailed in Chapter 2, Project Description, Tables 2.5 and 2.6 (i.e., with infrastructure improvements and the development of adjacent parcels), pp. 2.80-2.81 and 2.83-2.84. The AWCS Variant would include demolition of the same buildings as well as construction of the same shoreline improvements and transportation, utility, and open space networks. The AWCS Variant would not change any aspect of the Proposed Project related to demolition, excavation, and site grading; the construction of shoreline improvements; geotechnical stabilization; the construction of the transportation, open space, and utility infrastructure networks; or other improvements such as the construction of the new 20th Street pump station. Proposed development is expected to involve up to five phases (Phases 1 through 5) and is conceptual; however, construction is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. As with the Proposed Project, the multi-phased approach to project site development would result in project site occupancy and operations overlapping with, and being affected by, future construction phases.

Proposed Land Use Programs

The AWCS Variant does not include any changes to the land use programs for the Maximum Residential Scenario or Maximum Commercial Scenario defined for the Proposed Project. The AWCS Variant does not include any changes to the proposed open space network, traffic and circulation plan, new infrastructure and utility plans, geotechnical stabilization plan, or the shoreline improvement plan described in Chapter 2, Project Description.

[17] The decibel scale is used to quantify sound intensity.

Impact Evaluation

APPROACH TO ANALYSIS

The AWCS Variant does not involve any change to the mix of land uses, the space allocation of uses, or the residential unit count under the Maximum Residential Scenario and Maximum Commercial Scenario of the Proposed Project. Likewise, this variant does not involve any change to the locations, configurations, building envelopes, or depth of excavation of the programmed development under the two scenarios analyzed for the Proposed Project. Therefore, physical environmental effects under this variant would be substantially the same as those identified for the Proposed Project for the following environmental topics: Population and Housing, Wind and Shadow, Recreation, Utilities and Service Systems, Public Services, Biological Resources, Geology and Soils, Hazards and Hazardous Materials, and Agricultural and Forest Resources. All mitigation and improvement measures described for these topics under the Proposed Project would be applicable to this variant.

The following environmental topics are analyzed for this variant: Land Use and Land Use Planning, Cultural Resources (Archaeological Resources and Historic Architectural Resources), Transportation and Circulation, Noise and Vibration, Air Quality, Hydrology and Water Quality, and Mineral and Energy Resources.

LAND USE AND LAND USE PLANNING

As noted above the AWCS Variant would not include any changes to the Maximum Residential or Maximum Commercial Scenarios defined for the Proposed Project. Under this variant the new central waste collection facility would be developed in a new building on the asphalt lot on the BAE Systems Ship Repair Site north of Parcels A and B and new 20th Street and near the proposed 20th Street pump station. The central waste collection facility would be constructed as part of the first phase of development. As an infrastructure use, the central waste collection facility would not be substantially different from other infrastructure features and related uses on the project site or its vicinity. The central waste collection facility would be consistent with the existing zoning on the BAE Systems Ship Repair site which is M-2 (Heavy Industrial) as well as the 65-X Height and Bulk District. The proposed use of the new building near the 20th Street pump station on the BAE Systems Ship Repair site would be compatible with the adjacent land uses and would have less-than-significant land use impacts related to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.

Based on the above, project-level and cumulative land use and land use planning impacts under the AWCS Variant would be similar to those under the Proposed Project (see Section 4.B, Land

Use and Land Use Planning). Implementation of the AWCS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

CULTURAL RESOURCES

Archeological Resources, Human Remains, and Tribal Cultural Resources

Under the AWCS Variant there would be minimal excavation related to the construction of a new building adjacent to the proposed 20th Street pump station because the new building would not include a basement level. There would be no change to the depth and extent of excavation on the 28-Acre Site or the Illinois Parcels. As described in Section 4.D, Cultural Resources, the project site has been extensively altered over time resulting in low potential for prehistoric archeological resources. As further described, historic archeological resources such as subsurface architectural features related to the UIW Historic District, landscape features evidencing historic land uses, infrastructure features related to the former Union Iron Works/Bethlehem Steel industrial complex and associated industrial activities, refuse features related to Irish Hill habitation and industrial occupancies, and industrial features related to the various industries that have occupied the project site may be present on the project site. Although the potential for the discovery of historic archeological resources exists, the site history suggests that the rapid large-scale expansion of this area in response to the needs of World Wars I and II constituted a series of actions more likely to have damaged or destroyed valuable archaeological resources, than to have left behind any new significant resources. However, as discussed under Impacts CR-1 and CR-2 for the Proposed Project, the potential for encountering subsurface archeological resources, including human remains, cannot be conclusively ruled out, especially in those circumstances where excavation and grading would occur in previously undisturbed soils. Thus, as with the Proposed Project, with implementation of Mitigation Measures M-CR-1a: Archaeological Testing, Monitoring, Data Recovery and Reporting and M-CR-1b: Interpretation on pp. 4.D.25-4.D.30, the AWCS Variant would not cause a substantial adverse change to the significance of an archaeological resource, if present within the project site or the BAE Systems Ship Repair site.

The impacts of the AWCS Variant on tribal cultural resources would be substantially the same as those for the Proposed Project, i.e., less than significant (see Impact CR-3).

Historic Architectural Resources

The project site contains 11 contributors to the UIW Historic District (see Table 4.D.1: Contributing and Non-Contributing Buildings and Features on the Project Site, p. 4.D.35). The AWCS Variant would not include any changes to the Maximum Residential Scenario or Maximum Commercial Scenario defined for the Proposed Project; or the plans for the

preservation/rehabilitation/relocation of Buildings 2, 12, and 21; the demolition of Buildings 11, 15, 16, 19, 25, 32, and 66; the removal of the northern spur of the remnant of Irish Hill for construction of the new 21st Street; the transportation and open space network; the utility infrastructure; the public realm improvements; or the design principles identified in the *Pier 70 SUD Design for Development*.

Under the AWCS Variant, the central waste collection facility would be constructed in a new building on the asphalt lot located adjacent to the new 20th Street Pump Station. Conditions described for new infill construction under the Proposed Project (see Impact CR-11), Mitigation Measure M-CR-11: Performance Criteria and Review Process for New Construction (see pp. 4.D.103-106) would also be applicable to the AWCS Variant. Thus, the new building would be designed to be compatible with the UIW Historic District. In addition, the land use program for the Proposed Project and the variant would be the same; thus, as with the Proposed Project, the impacts associated with the demolition of historic resources, the rehabilitation of existing resources, and the construction of new buildings within and adjacent to the existing UIW Historic District and the remnant of Irish Hill would be less than significant or unchanged from that of the Proposed Project.

Therefore, the project-level and cumulative historic architectural resource impacts under the AWCS Variant would be the same as, or similar to, those discussed for the Proposed Project under Impacts CR-4 through CR-12 and Impact C-CR-2 in Section 4.D, Cultural Resources. As with the Proposed Project, with implementation of Improvement Measures I-CR-4a: Documentation and I-CR-4b: Public Interpretation, on pp. 4.D.91-4.D.92, the less-than-significant impact related to the proposed demolition of seven contributing features would be reduced. Furthermore, as with the Proposed Project, with implementation of Mitigation Measures M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria and M-CR-11: Performance Criteria and Review Process for New Construction, on pp. 4.D.93-4.D.94 and pp. 4.D.103-4.D.106, the project-level and cumulative impacts of the relocation and rehabilitation of contributing features as well as the compatibility of new structures would be reduced so as not to cause a substantial adverse change to historic architectural resources.

Based on the above, project-level and cumulative cultural resource impacts under the AWCS Variant would be similar to those identified under the Proposed Project (see Section 4.D, Cultural Resources). Implementation of the AWCS Variant would not change the analysis or conclusions in that section, would not result in new or more severe impacts, and no new mitigation measures would be required.

TRANSPORTATION AND CIRCULATION

Demolition, excavation, site grading, and construction activities under the AWCS Variant would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project (see Figures 2.26 and 2.27 and Tables 2.5 and 2.6, pp. 2.80-2.85). Under this variant the construction of the proposed central waste collection facility would likely occur during the first phase of development. The associated pipeline system would be placed within the public right-of-way at the same time as the construction of the proposed transportation and utility infrastructure networks and adjacent Parcels. As a result there would be additional construction truck traffic trips associated with the construction of the central waste collection facility and the installation of the AWCS infrastructure. As discussed under Impact TR-1 for the Proposed Project, the same construction truck traffic routes (e.g., Third Street and either 25th or Mariposa streets to access I-280 to travel south; Third Street and either Second or Fifth streets to reach the Bay Bridge and the East Bay; and Third Street, Howard Street, and Van Ness Avenue (U.S. 101) to travel to North Bay destinations) would be used under this variant. Implementation of the AWCS Variant would result in a slight increase in construction truck trips due to the need to transport materials for the construction of the central waste collection facility as well as associated equipment and the pipeline system; however, this increase would make up a relatively small portion of the construction truck traffic generated during each construction phase. Thus, construction-related impacts under this variant would be slightly greater than those for the Proposed Project, but would not result in an increase in severity of impacts or new significant impacts. The temporary (and less than significant) impacts associated with construction-related traffic of the Proposed Project are described under Impact TR-1, and that impact analysis would be applicable to this variant for the same reasons as stated for the Proposed Project (i.e., construction-related transportation impacts would be temporary and potential conflicts between construction activities and pedestrians, bicyclists, transit vehicles and auto vehicles, and between construction activities and nearby businesses and residents would be managed through City ordinances, regulations, and BMPs).

The AWCS Variant would not result in substantial increases in operational VMT because it does not alter the development Scenarios for the Proposed Project. With respect to operational impacts, operational-related changes under this variant would be limited to a slight decrease in the number of trash collection truck trips to transfer station and recycling facilities in San Francisco for the off-site hauling of solid waste. There would be one trash collection truck trip per day under this variant as compared to the Proposed Project which would have at least two trips per week for each individually serviced residential and commercial building. The reduction would be a function of the more efficient handling of the solid waste streams at the central waste collection facility (e.g., enhanced compaction) as opposed to a reduction in the amount of solid waste generated by future residents, employees and visitors to the project site. In addition to the

slight reduction in the number of trash collection trucks trips under this variant, trucks associated with this activity would not circulate on the project site to visit individual buildings to collect recyclables, compostables, and trash but instead travel to the central waste collection facility to collect these materials. Thus, under this variant internal trash collection truck trips would be consolidated onto 20th Street/new 20th Street resulting in a slight decrease in truck-related VMT. The truck trip reduction would be small in relation to the overall numbers of vehicle trips generated by the Proposed Project and would not substantially affect total vehicle miles traveled as a result of operations of the Proposed Project. Delivery of supplies for operation and maintenance of the central waste collection facility would be similar to loading activities described for the Proposed Project, and would not substantially increase the demand for loading facilities. Emergency access would not be affected by the central waste collection facility located within a proposed new building north of Parcels A and B on the BAE Systems Ship Repair site because this infrastructure would not introduce any changes to the transportation network that would affect emergency access. The truck trips associated with the maintenance and operation of the central waste collection facility under this variant would change the circulation patterns on the project site (e.g., consolidation of solid waste collection truck trips onto 20th Street as opposed to being dispersed throughout the project site), but the change would be minimal. There would be minimal or no change to transit, pedestrian, or bicycle effects from the AWCS Variant. Thus, due to the minor decrease in trash collection truck trips, operational-related project-level and cumulative transportation and circulation impacts under the AWCS Variant would be the same as, or slightly less than, those discussed for the Proposed Project (see Section 4.E, Transportation and Circulation). Therefore, all operational-related mitigation measures identified for the Proposed Project would also be applicable to the AWCS Variant (i.e., Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus routes as needed [pp. 4.E.91-4.E.93] under Impact TR-5; Mitigation Measure M-TR-10: Improve pedestrian facilities on Illinois Street adjacent to and leading to the project site [pp. 4.E.99-4.E.100] under Impact TR-10; Mitigation Measure M-TR-12a: The Project's Transportation Coordinator should coordinate with building tenants and delivery services to minimize deliveries during a.m. and p.m. peak periods [p. 4.E.105] under Impact TR-12; Mitigation Measure M-TR-12b: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed [p. 4.E.105] under Impact TR-12; Mitigation Measure M-C-TR-4a: Increase capacity on the 48 Quintara/24th Street bus route under the Maximum Residential Scenario [p. 4.E.118] under Impact C-TR-4; and Mitigation Measure M-C-TR-4b: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario [p. 4.E.118] under Impact C-TR-4). There would be no modifications to the below-grade parking program under this variant thus there would be no changes to the overall parking program under the Proposed Project.

Based on the above, project-level and cumulative transportation and circulation impacts under the AWCS Variant would be similar to, or slightly less than, those identified under the Proposed

Project (see Section 4.E, Transportation and Circulation). Implementation of the AWCS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

NOISE AND VIBRATION

Under the AWCS Variant construction-related noise and vibration would be generated by the same construction equipment as that for the Proposed Project. Under this variant demolition, excavation, site grading, and construction activities would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. The proposed central waste collection facility would likely be installed during the first phase of development and the associated pipeline system would be emplaced within the public right-of-way at the same time as construction of the proposed transportation and utility infrastructure networks and adjacent parcels. As discussed under Impact NO-2 in Section 4.F, Noise and Vibration, the multi-phased approach to project site development would result in the exposure of sensitive receptors (e.g., the residential land uses on the Illinois Parcels – Parcels HDY1, HDY2, PKN, and PKS) to noise from active construction phase(s) and operational noise associated with the occupancy and operation of previously completed phases. Further, construction-related traffic increases from all new development on the project site would use the same roads (20th, new 21st, and new 22nd streets) to access the project site from Illinois Street, exposing the same sensitive receptors (those facing these streets on Parcels C2, F, G, HDY, PKN, and PKS) to construction traffic noise increases (over the 11 years of construction).

The noise associated with the construction of the proposed central waste collection facility on the BAE Systems Ship Repair site near the proposed 20th Street pump station and placement of the associated pipeline system within the public rights-of-way along with all the other transportation and utility infrastructure would be similar to, or slightly greater than, that for the Proposed Project. The minor increase in the number of construction truck trips under this variant would be a result of materials delivery for the AWCS equipment and associated piping. Thus, under this variant the construction-related increases in ambient noise levels during the various construction phases would be expected to be incrementally greater than that which would be generated under the Proposed Project (primarily due to an incremental increase in construction truck traffic) but would remain less than significant with mitigation. Therefore, as with the Proposed Project, the construction-related noise mitigation measures identified for the Proposed Project would be applicable to the AWCS Variant. Under the Proposed Project, the finding of a significant and unavoidable construction-related impact for the Proposed Project would be associated with the potential for pile driving for building foundations. Since the central waste collection facility would not be expected to need a pile foundation, the AWCS Variant would not contribute to this

significant noise impact. However, mitigation measures applicable to the Proposed Project would also be applicable to the AWCS Variant.

The proposed central waste collection facility would be located north of Parcels A and B on the BAE Systems Ship Repair site and noise generated by the operation of the suction equipment fans and air compressors, wet scrubbers, waste separators, and compactors in the central waste collection facility would be contained within the structure. Sound insulation in the form of acoustical treatments on walls and ceilings, and silencers or other noise-dampening methods on the exhaust pipe would be provided around the fan and/or collection area to minimize ambient noise from the facility and meet daytime and nighttime noise ordinance limits at the closest residential receptors. Shielding and enclosing this facility would be sufficient to ensure compliance with the San Francisco Noise Ordinance. In addition, the project sponsors would be required to ensure that all collection systems within individual buildings on the project site would meet San Francisco Noise Ordinance requirements for building mechanical systems.

Under the AWCS Variant, operational noise associated with the trash collection trucks accessing the project site would occur but it would be less than that for the Proposed Project because there would be fewer internal truck trips and fewer truck trips to and from the project site. In addition, operational noise associated with the handling and collection of solid waste at each individual building would not occur under this variant. Under this variant, the consolidation of the internal trash collection truck trips to new 21st Street would result in a reduction in ambient noise levels along the project site's other existing and proposed streets, most of which would include future residential land uses with sensitive receptors. Thus, under this variant the reduction in trash collection truck trips and the consolidation of trash collection truck routes to new 21st Street would result in minor localized changes to the existing ambient noise levels.

Under the AWCS Variant, compliance with the requirements of the San Francisco Noise Ordinance (as required in Mitigation Measure M-NO-4a: Stationary Equipment Noise Controls on p. 4.F.50) would ensure that incremental noise increases related to the operation of the proposed central waste collection facility would not significantly increase ambient noise levels. When considered together with the incremental noise decreases related to the reduction of internal and off-site trash collection truck trips, changes to ambient noise levels under this variant would likely not be discernible in the context of the existing ambient noise levels. Thus, operational-related project-level impacts under the AWCS Variant would be substantially the same as those discussed for the Proposed Project, and would be significant and unavoidable with mitigation (see Section 4.F, Noise and Vibration). Thus, all operational-related mitigation measures identified for the Proposed Project would also be applicable to the AWCS Variant.

Based on the above, project-level and cumulative noise and vibration impacts under the AWCS Variant would be similar to, or slightly greater than those identified under the Proposed Project

(see Section 4.F, Noise and Vibration). Implementation of the AWCS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

AIR QUALITY

Under the AWCS Variant construction-related air quality emissions would be generated by the same construction equipment as that for the Proposed Project. Under this variant, demolition, excavation, site grading, and construction activities would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. As with the Proposed Project, the multi-phased approach to project site development would result in simultaneous emissions from active construction phase(s) and the occupancy and operation of previously completed phases (e.g., the residential land uses on the Illinois Parcels – Parcels HDY1, HDY2, PKN, and PKS). The installation of the proposed central waste collection facility would likely occur during the first phase of development and the associated pipeline system would be emplaced within the public right-of-way at the same time as the construction of the proposed transportation and utility infrastructure networks and adjacent parcels. Due to the additional materials needed for the installation of the central waste collection facility and the associated pipeline system, the number of construction truck trips under this variant would be slightly greater than under the Proposed Project. As a result of the construction of the new central waste collection facility and the increase in construction truck traffic, emissions of criteria air pollutants during the various construction phases under this variant would be slightly greater than that which would be generated under the Proposed Project. Thus, construction-related air quality impacts under the AWCS Variant would be slightly greater than those for the Proposed Project. Mitigation Measure M-AQ-1a: Construction Emissions Minimization on pp. 4.G.42-4.G.44, identified for the Proposed Project, would be applicable to the AWCS Variant.

As noted above, the AWCS Variant would not include any changes to the Maximum Residential or Maximum Commercial Scenarios defined for the Proposed Project. However, under this variant, unlike the Proposed Project, a central waste collection facility would be located north of Parcels A and B on the BAE Systems Ship Repair site and would be a new source of criteria air pollutant emissions that would be permitted and regulated by the BAAQMD. Under this variant operation of the central waste collection facility would result in a slight overall decrease in total emissions because it has the potential to operate more efficiently and reduce the number of trash collection truck trips compared to the Proposed Project. Under the AWCS Variant, internal trips would be consolidated onto new 20th Street and the overall number of off-site truck trips would be reduced due to more efficient handling of the solid waste streams at the central waste collection facility (i.e., compaction and containerization).

The central waste collection facility would be regulated by the BAAQMD as a miscellaneous source to ensure that PM_{10} emissions would be limited by the BAAQMD's Best Available Control Technology for "Solid material storage –Enclosed."[18] Emissions from the exhaust of the central waste collection facility would be expected to be minimal due to the design of the filtering system. Wet scrubbers at the central waste collection facility would be designed and operated to remove airborne particulate matter that could emanate from this facility. Based on typical design and installation of filtration systems, which would be required pursuant to BAAQMD's Best Available Control Technology requirements for miscellaneous sources, PM_{10} emissions from exhaust from the central waste collection facility would be modest. An operations plan would implement Best Available Control Technology requirements to limit PM_{10} emissions. Thus, given the potential for both emissions increases and decreases associated with the AWCS Variant, overall operational emissions generated under this variant would be similar to those of the Proposed Project.

Under the AWCS Variant, construction of the central waste collection facility could result in a slight increase in emissions of criteria air pollutants over the amount estimated for the Proposed Project and operation of the central waste collection facility could result in a slight decrease in vehicular emissions with the decrease in trash collection truck trips. It is not expected that the operational decrease in truck emissions would balance the increase in construction truck emissions during the multi-phase construction period, and operation of the collection facility could slightly increase emissions. The central waste collection facility would likely be developed as part of the second phase of development and become operational upon completion and occupancy of the first residential buildings under Phases 2 through 5. As shown in Tables 4.G.7 and 4.G.8 on pp. 4.G.38-4.G.39 and 4.G.54-4.G.55 for the Proposed Project, construction-related emissions during the concurrent construction of Phases 1 and 2 would be less than significant. However, the combined emissions from Phase 3 construction and the occupancy and operation of Phases 1 and 2; from Phase 4 construction and the occupancy and operation of Phases 1 through 3; and from Phase 5 construction and the occupancy and operation of Phases 1 through 4 would exceed the significance thresholds for certain criteria air pollutants. As with the Proposed Project, under this variant the combined criteria pollutant emissions generated during a construction phase and the occupancy and operation of a previously completed phase(s) would result in significant air quality impacts. Thus, the operational-related air quality impacts under the AWCS Variant would be the same as, or slightly greater than, the impacts of the Proposed Project and would be significant and unavoidable (see Section 4.G, Air Quality). The

[18] BAAQMD, Best Available Control Technology Guideline, Section 11, Miscellaneous Sources, Solid Material Storage – Enclosed, Document # 1571.1, 10/18/91. Available online at http://data.baaqmd.gov/pmt/bactworkbook/default.htm. Accessed November 1, 2016.

operational-related mitigation measures identified for the Proposed Project would therefore be applicable to the AWCS Variant.

Under the AWCS Variant, as with the Proposed Project, TAC emissions from construction and occupancy and operation would expose sensitive receptors to substantial pollutant concentrations of TACs and result in a localized health risk. Although there would be a decrease in the number of internal and off-site trash collection truck trips needed to transport solid waste off site under this variant, the exposure of sensitive receptors to substantial pollutant concentrations of TACs would be slightly increased as a result of emissions from additional construction truck trips and the operation of the central waste collection facility, and, as with the Proposed Project, would result in a significant impact. As discussed under Impact AQ-3, the exposure of on-site sensitive receptors to increased TAC emissions from construction equipment as well as stationary sources (e.g., diesel back-up generators) would be reduced to a less-than-significant level with implementation of Mitigation Measures M-AQ-1a: Construction Emissions Minimization and M-AQ-1b: Diesel Backup Generator Specifications. These mitigations measures would be applicable to the AWCS Variant ensuring that implementation of the AWCS Variant would also be less-than significant with mitigation.

As with the Proposed Project, the AWCS Variant would be consistent with the 2010 Clean Air Plan, and impacts would be less than significant with implementation of the Transportation Demand Management Plan (TDM) (see "TDM Plan," in Section 4.E, Transportation and Circulation, pp. 4.E.46-4.E.47), which includes strategies to discourage the use of automobiles and encourage transit and other modes of transportation. Other mitigation measures of the Proposed Project, identified under Impact AQ-1 that would also be applicable to the AWCS Variant in regards to consistency with the 2010 Clean Air Plan are as follows:

- Mitigation Measure M-AQ-1a : Construction Emissions Minimization Plan (requiring low NOx emitting construction vehicles; requiring Tier 4, low-emissions construction vehicles),
- Mitigation Measure M-AQ-1b: Diesel Backup Generator Specifications (reducing NOx associated with operation)
- Mitigation Measure M-AQ-1f: Transportation Demand Management,
- Mitigation Measure M-AQ-1g: Additional Mobile Source Control Measures (preferential parking and/or charging stations for fuel-efficient vehicles and a neighborhood electric vehicle program), and
- Mitigation Measure M-AQ-1h: Emissions Offset of Operational Emissions (implement replacement or repair of high-emitting vehicles).

Thus, as with the Proposed Project, the implementation of the TDM strategies and mitigation measures would ensure the project includes relevant transportation control measures specified in the Clean Air Plan (see Impact AQ-4). The TDM Plan and mitigation measures would be

applicable to the AWCS Variant ensuring that implementation of the AWCS Variant would also be less-than significant with mitigation.

Solid waste collection systems have the potential to generate odors from organic decomposition and other odorous waste. However, as described above, the subsurface pipeline system would be under negative pressure and would receive frequent "flushes" with jets of air. At the central waste collection facility, each of the three waste streams (recyclables, compostables, and trash) would typically enter its designated waste separator and fall into a feed hopper and then a compactor. The material would then be pushed (and compacted) into containers. Full containers would be disconnected from the compactor, sealed, and moved to a staging location. An empty container would be moved into place and connected to the compactor. The containers would be moved using an automated rail-based or other automated positioning system. The staged (full) containers would be stored for loading onto trucks. This typical process would generally keep the material under sealed conditions, reducing the potential for odors in the vicinity of the central waste collection facility. A significant odor impact is not expected under this variant because the AWCS pipeline system would be under negative pressure and the containers receiving the waste would be sealed and transported off site on a daily basis ensuring that organic material in the system would not be expected to linger long enough to produce objectionable odors. Thus, as with the Proposed Project, the impacts of the AWCS Variant related to the creation of objectionable odors that would affect a substantial number of people would be less than significant (see Impact AQ-5).

Based on the above, project-level and cumulative air quality impacts under the AWCS Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.G, Air Quality). Implementation of the AWCS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

GREENHOUSE GAS EMISSIONS

A variety of controls are in place to ensure that development in San Francisco would not impair the State's ability to meet Statewide GHG reduction targets outlined in AB 32, nor impact the City's ability to meet San Francisco's local GHG reduction targets. Projects that are consistent with San Francisco's GHG Reduction Strategy would not contribute significantly to global climate change. Similar to the Proposed Project, the AWCS Variant would be required to comply with these regulations and requirements that reduce GHG emissions (see Table 4.H.2: Regulations Applicable to the Proposed Project, in Section 4.H, Greenhouse Gas Emissions, pp. 4.H.13-4.H.28). Since the AWCS Variant would comply with GHG reduction measures required in various City ordinances and would be consistent with all the regulations applicable to the Proposed Project, it would comply with San Francisco's Greenhouse Gas Reduction Strategy.

Therefore, as with the Proposed Project, the AWCS Variant would have a less than cumulatively considerable contribution to significant cumulative GHG impacts.

Implementation of the AWCS Variant would result in an incremental increase in construction truck trips over that for the Proposed Project due to materials delivery, i.e., equipment and associated piping system. Thus construction activities that would result in GHG emissions would be slightly more intensive than those for the Proposed Project.

The AWCS Variant would not alter the operational GHG emissions increases associated with the Proposed Project because this variant would not change the two land use scenarios defined for the Proposed Project. As with the Proposed Project, this variant would introduce a mixed-use development in an area that is served by public transit, and would include Class I and Class II bicycle parking spaces, energy efficiency features beyond Title 24 requirements, low-impact stormwater management design, water-efficient landscaping, water-conserving interior design, convenient recycling and composting, street trees, and other features consistent with San Francisco's ordinances and requirements. Similar to the Proposed Project, development would be consistent with the Sustainable Communities Strategy by including residential and commercial uses in a designated Priority Development Area per Plan Bay Area, furthering the region's goals for reducing GHG emissions. Implementation of local GHG reduction requirements would substantially reduce a project's GHG emissions. In addition, under the AWCS Variant energy usage would be more efficient than under the Proposed Project, and, as a result, GHG emissions with implementation of this variant may not be as great as that for the Proposed Project. Furthermore, as described in Section 4.H, Greenhouse Gas Emission, implementation of air quality mitigation measures would also have the added benefit of further reducing GHG emissions from the Proposed Project. Mitigation Measures M-AQ-1a through M-AQ-1h, shown in Section 4.G, Air Quality, on pp. 4.G.42-4.G.51, would help reduce emissions of GHGs through the reduction in construction emissions; limitations on diesel generators; use of low VOC architectural coatings and green consumer products; electrification of loading docks; encouragement of the use of transit and non-motorized modes of transportation; and emission offsets. These mitigation measures would also be applicable to the AWCS Variant and would further reduce this variant's less-than-significant GHG emissions.

Based on the above, GHG impacts under the AWCS Variant would be similar to those identified under the Proposed Project (see Section 4.H, Greenhouse Gas Emissions). Implementation of the AWCS Variant would not result in new or more severe impacts and would not change the analysis or conclusions in that section.

HYDROLOGY AND WATER QUALITY

Demolition, excavation, site grading, and construction activities under the AWCS Variant would be substantially the same as those for the Proposed Project and would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project (see Figure 2.26: Proposed Phasing Plan – Maximum Residential Scenario, Figure 2.27: Proposed Phasing Plan – Maximum Commercial Scenario, Table 2.5: Project Construction Phasing – Maximum Residential Scenario, and Table 2.6: Project Construction Phasing – Maximum Commercial Scenario, on pp. 2.80-2.85). The AWCS Variant would not change any aspect of the Proposed Project as it relates to demolition, excavation, site grading, and construction activities; the construction of shoreline improvements; geotechnical stabilization; or other site improvements. Thus, ground disturbance under this variant would be substantially the same as that for the Proposed Project (including both scenarios; the combined, separate, or hybrid options for wastewater and stormwater management, and the three options for grading around Building 12) and construction-related hydrology and water quality impacts under this variant would be substantially the same as those for the Proposed Project.

This variant also includes the same development scenarios (Maximum Residential and Maximum Commercial) as the Proposed Project. The only difference between the AWCS Variant and the Proposed Project is that the variant would generate wastewater from the wet scrubbers installed at the AWCS facility. Regardless of the wastewater and stormwater management option implemented, the wastewater from the AWCS Variant would be discharged to the City's combined sewer system. Accordingly, this discharge would be subject to Article 4.1 of the Public Works Code, as supplemented by Order No. 158170. Therefore, water quality impacts as a result of wastewater discharges under the AWCS Variant would be less than significant as they would be for the Proposed Project (see Impact HY-2).

Based on the above, project-level and cumulative hydrology and water quality impacts under the AWCS Variant would be similar to, or slightly greater than, those identified under the Proposed Project (see Section 4.O, Hydrology and Water Quality). Implementation of the AWCS Variant would not result in new or substantially more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

MINERAL AND ENERGY RESOURCES

Environmental impacts associated with mineral and energy resources under the AWCS Variant would be the same as or similar to the environmental impacts addressed in Section 4.Q, Mineral and Energy Resources, for the Proposed Project. The variant would have no impact on mineral resources, consistent with the Proposed Project as addressed in Impact ME-1. Demolition,

excavation, site grading, and construction activities under the AWCS Variant would be conducted according to the same construction phases (Phases 1 through 5) as under the Proposed Project. As described above, under this variant construction of the AWCS facility would occur as part of the first phase of development. Construction of the associated collection system would occur according to the phase associated with the adjacent Parcels and would occur in concert with other infrastructure improvements. Implementation of the AWCS Variant would result in a slight increase in construction truck trips due to the need to transport materials for the construction of the new facility and associated pipeline system. Due to the increased fuel usage for the additional construction truck trips, construction-related energy impacts under this variant would be slightly greater than those for the Proposed Project. However, as with the Proposed Project, energy impacts under this variant would be less than significant because construction-related activities would be temporary.

Under the AWCS Variant, unlike the Proposed Project, a new 10,000-square-foot central waste collection facility would be developed in the vicinity of the new 20th Street pump station on the BAE Systems Ship Repair site north of the proposed commercial uses on Parcels A and B. Under this variant, operational-related changes associated with the central waste collection facility would result in the use of electricity and transportation fuel above that estimated for the Proposed Project (see Table 4.Q.1: Estimated Electrical and Natural Gas Demand at Full Build-out for the Maximum Residential Scenario and the Maximum Commercial Scenario, Excluding Solar Photovoltaic and Solar Thermal, and Table 4.Q.2: Approximate Transportation Fuel Demand at Full Build-out for the Maximum Residential Scenario and the Maximum Commercial Scenario, on pp. 4.Q.15 and 4.Q.19). Under AWCS Variant, unlike the Proposed Project, the collection of solid waste using forced air in the subsurface pipeline system, its handling within the proposed facility, and its subsequent off-site transport after compaction would result in increased usage of electricity and transportation fuel. In addition, the use of water for the wet scrubbers would represent an incremental increase in water usage over that for the Proposed Project. Under the AWCS Variant, internal and off-site trash collection truck trips would be reduced and would result in the decreased use of transportation fuel. Energy required to operate the central waste collection facility would not be used in a wasteful manner because the Proposed Project would be required to meet current State and local codes and ordinances concerning energy consumption, including Title 24 and the applicable regulations listed in the San Francisco GHG Checklist. Therefore, energy-related impacts under this variant could be slightly greater than that for the Proposed Project, but would continue to be less than significant and would not require the construction of new, or the expansion of, existing electric transmission/distribution facilities (see discussions under Impacts ME-2 and ME-3).

Based on the above, project-level and cumulative mineral and energy impacts under the AWCS Variant would be similar to those identified under the Proposed Project (see Section 4.Q, Mineral

and Energy Resources). Implementation of the AWCS Variant would not result in new or more severe impacts, would not change the conclusions or mitigation measures identified in that section, and no new mitigation measures would be required.

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7. ALTERNATIVES TO THE PROPOSED PROJECT

A. INTRODUCTION

Chapter 7, Alternatives to the Proposed Project, presents the alternatives analysis as required by the California Environmental Quality Act (CEQA) for the proposed Pier 70 Mixed-Use District Project. The chapter identifies a reasonable range of alternatives to the Proposed Project and evaluates their environmental effects as compared to those of the Proposed Project and each of its scenarios. The ability of the alternatives to meet project objectives is discussed, and an environmentally superior alternative is identified based on the impact analysis. Finally, other alternative concepts that were considered but eliminated from detailed consideration are summarized, along with the reasons for their elimination.

CEQA Guidelines Section 15126.6(a) requires that an Environmental Impact Report (EIR) evaluate "a range of reasonable alternatives to the project, or the location of the project, which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects, and evaluate the comparative merits of the alternatives." An EIR need not consider every conceivable alternative to a proposed project. Rather, it must consider a range of potentially feasible alternatives governed by the "rule of reason" in order to foster informed decision-making and public participation (CEQA Guidelines Section 15126.6(f)).

CEQA Guidelines Sections 15126.6(f)(1) and (f)(3) state that "among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent)" and that an EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." The final determination of feasibility will be made by project decision-makers based on substantial evidence in the record.

Alternatives Selected for Detailed Analysis

The following alternatives are analyzed in this chapter:

- No Project Alternative
- Code Compliant Alternative
- 2010 Pier 70 Master Plan Alternative

These three alternatives were determined to adequately represent the range of feasible alternatives required under CEQA for the Proposed Project. They would each lessen significant adverse impacts that were identified for the Proposed Project. Table 7.1: Comparison of Proposed Project to Alternatives and Summary of Their Significant and Unavoidable Impacts, summarizes and compares the characteristics of the Proposed Project and its significant and unavoidable impacts to those of the alternatives.

As shown in Table 7.1, and as identified, described, and evaluated in EIR Chapter 4, Environmental Setting and Impacts, the Proposed Project would result in significant and unavoidable impacts related to Transportation (TR-5, bus transit; TR-12, loading demand; and C-TR-4, cumulative bus transit), Noise and Vibration (NO-2, construction noise; NO-5, operational noise; and C-NO-2, cumulative operational noise), and Air Quality (AQ-1, construction dust and criteria air pollutants; AQ-2, operational emissions of criteria air pollutants; and C-AQ-1: cumulative regional air quality impacts).

As shown in Table7.1, the No Project Alternative would result in a continuation of existing conditions within the project site and would thereby not result in any project impacts. The Code Compliant Alternative and the 2010 Pier 70 Master Plan Alternative would each reduce the duration and site disturbance of construction from that under the Proposed Project and would thereby reduce the significant and unavoidable construction-related Noise and Vibration and Air Quality impacts, but not to a less-than-significant level. During operation, these alternatives would each reduce the population of residents, employees, and visitors within the project site from that under the Proposed Project and would thereby reduce the significant and unavoidable operational Transportation, Noise and Vibration, and Air Quality impacts, but not to a less-than-significant level.

The three alternatives are presented and analyzed below in Sections B, C and D, respectively. Each section presents a description of the alternative and a detailed analysis of its impacts compared to those of the Proposed Project. The impact analysis is based on the same environmental setting and significance thresholds as presented for each resource topic in Chapter 4 and uses the same approach to analysis. The analysis here is generally qualitative relative to the identified impacts of the Proposed Project. Transportation, Noise, and Air Quality present a quantitative analysis in order to provide a more refined comparison of the severity of impacts associated with the alternatives relative to those of the Proposed Project.

Section F, Alternatives Considered and Rejected, pp. 7.95-7.98, identifies alternatives that were considered by the lead agency and identifies the reasons for their elimination from detailed consideration in the EIR (e.g., ability to meet the project objectives; ability to substantially lessen or avoid environmental effects associated with the Proposed Project; and potential feasibility).

Table 7.1: Comparison of Proposed Project to Alternatives and Summary of Their Significant and Unavoidable Impacts

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Legend: NI = No Impact; LS = Less than Significant; SU = Significant and unavoidable; SUM = Significant and unavoidable impact with mitigation; NA = Not Applicable					
Characteristics of Proposed Project and Alternatives					
Zoning/Height Limits	SUD/65-X, 90-X, 40-X	SUD/65-X, 90-X, 40-X	M-2/65-X, 40-X	M-2 and P/65-X, 40-X	SUD/90-X
Existing buildings (gsf)	351,800	351,800	351,800	351,800	351,800
Existing buildings to be retained (gsf)	237,800	237,800	351,800	227,800	293,228
Residential (gsf)	2,630,000	1,430,000	0	519,950	160,440
No. of units	3,025	1,645	0	590	195
Commercial (gsf)	1,102,250	2,262,350	0	1,162,260	1,698,780
RALI (gsf)	479,980	486,950	0	199,150	294,110
Retail	269,795	275,075	0	156,780	188,610
Restaurant	67,375	68,765	0	0	0
Arts/Light-Industrial	143,110	143,110	0	42,370	105,500
Total (gsf)	**4,212,230**	**4,179,300**	**351,800**	**1,881,360**	**2,153,330**
Total Parking (spaces)	3,656	3,781	323	1,135	2,525
Off-street	*3,371*	*3,496*	*171*	*985*	*2,120*
On-street	*285*	*285*	*152*	*150*	*405*
Open Space	9 acres	9 acres	0	5.76 acres	8.07 acres
Grading (cy)					
Export	340,000	340,000	0	47,962	47,962
Import	20,000	20,000	0	8,900	8,900

Table 7.1 Continued

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Ability to meet Project sponsors Objectives?*	Yes	Yes	No	Some	Some
Summary of Significant and Unavoidable Impacts of Proposed Project and Alternatives					
Transportation					
TR-5: The Proposed Project would cause one individual Muni route to exceed 85 percent capacity utilization in the a.m. and p.m. peak hours in both the inbound and outbound directions.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
TR-12: The Proposed Project's loading demand during the peak loading hour would not be adequately accommodated by proposed on-site/off-street loading supply or in proposed on-street loading zones, which may create hazardous conditions or significant delays for transit, bicycles or pedestrians.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
C-TR-4: The Proposed Project would contribute considerably to significant cumulative transit impacts on the 48 Quintara/24th Street and 22 Fillmore bus routes.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)

Table 7.1 Continued

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Noise and Vibration					
NO-2: Construction of the Proposed Project would cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
NO-5: Operation of the Proposed Project would cause substantial permanent increases in ambient noise levels along some roadway segments in the project site vicinity.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
C-NO-2: Operation of the Proposed Project, in combination with other cumulative development, would cause a substantial permanent increase in ambient noise levels in the project vicinity.	SUM	SUM	NI	Less than the Proposed Project (LS)	Less than the Proposed Project (LS)
Air Quality					
AQ-1: Construction of the Proposed Project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)

Table 7.1 Continued

	Proposed Project – Maximum Residential Scenario	Proposed Project – Maximum Commercial Scenario	No Project Alternative	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
AQ-2: At project build-out, the Proposed Project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)
C-AQ-1: The Maximum Residential or Maximum Commercial scenarios, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative regional air quality impacts.	SUM	SUM	NI	Similar to but less than the Proposed Project (SUM)	Similar to but less than the Proposed Project (SUM)

Source: Forest City 2016, SWCA 2016

B. NO PROJECT ALTERNATIVE

CEQA Guidelines Section 15126.6(e) requires that, among the project alternatives, a "no project" alternative be evaluated. CEQA Guidelines Section 15126.6(e)(2) requires that the no project alternative analysis "discuss the existing conditions…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and policies and consistent with the available infrastructure and community services." As noted in CEQA Guidelines Section 15126.6, an EIR on "a development project on identifiable property," typically analyzes a no project alternative, i.e., "the circumstance under which the project does not proceed. Such a discussion would compare the environmental effects of the property remaining in its existing state against environmental effects that would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this 'no project' consequence should be discussed."

Description

Under the No Project Alternative, existing conditions at the project site would not change. The 35-acre project site, which contains approximately 351,800 gross square feet (gsf) of mostly vacant buildings and facilities, most of which are unoccupied, would be retained in its current condition with the current level of maintenance (e.g., roof, window, and door repairs; building systems maintenance [electrical, plumbing, and life safety]; and cosmetic repairs [painting]). Current uses on the site, all of which are either on short-term leases or are temporary, would continue. The Port of San Francisco would continue to renew the existing short-term leases on the project site, or undertake other similar short term leases; no tenant relocation plan would be proposed. While it is likely that the project sponsors could develop portions or all the 28-Acre Site and Illinois Parcels over a period of time, such development is speculative and therefore not analyzed under the No Project Alternative.

Under the No Project Alternative, there would be no amendment to the Planning Code, no rezoning of the entire 35-acre project site, no height increase for the 28-Acre Site, and no adoption of a special use district (SUD) enabling development controls. None of the approximately 3,422,265 gsf or 801,400 gsf of new buildings and improvements to existing structures on the 28-Acre Site and the Illinois Parcels, respectively, proposed as part of the Proposed Project would be constructed or improved. No new proposed residential, commercial, retail/arts/light-industrial (RALI) or open space uses would be constructed on the project site under this alternative. No affordable residential units complying with the City's Affordable Inclusionary Housing Ordinance would be built. There would be no demolition or rehabilitation of contributors to the Union Iron Works National Register Historic District (UIW Historic

District) on the project site. There would be no traffic or street and circulation improvements, no infrastructure or utilities improvements, no new 20th Street Pump Station, no grading or stabilization improvements, and no shoreline protection or sea level rise adaptation strategies on the project site. See Table 7.16: Ability of Alternatives to Meet Project Objectives, on pp. 7.92-7.95.

There would be no exchange of land under the Public Trust Exchange Agreement.

Impacts of the No Project Alternative

This analysis assumes that the existing on-site structures and uses on the project site would not change and that the existing physical conditions, as described in detail for each environmental topic in Chapter 4, Environmental Setting and Impacts, would remain the same.

If the No Project Alternative were implemented, none of the impacts associated with the Proposed Project, as described in Chapter 4, would occur. The No Project Alternative would not preclude future development of the project site with a range of land uses that are principally permitted at the project site. Development and growth would continue within the vicinity of the project site as nearby projects are approved, constructed, and occupied. These projects would contribute to significant cumulative impacts in the vicinity, but under the No Project Alternative, the existing land use activity on the project site would continue and would therefore not contribute to these cumulative impacts beyond existing levels.

LAND USE AND LAND USE PLANNING

Under the No Project Alternative, existing land use conditions on the project site would not change. The project site would continue to include approximately 351,800 gsf of mostly vacant and deteriorating buildings and facilities. Existing uses on the site, such as special event venues, artists' studios, storage facilities, automobile storage lots, parking, soil recycling, and office spaces could continue into the foreseeable future. (Building 117 within the project site would be demolished as part of a separate 20th Street Historic Core Building 117 Project, Case No. 2016-000346E.) No redevelopment of the project site as a mixed-use neighborhood would occur. None of the project approvals required for the Proposed Project would be required. As under the Proposed Project, which would not result in any significant land use effects and would not physically divide an established community, nor result in an adverse impact upon the existing character of the project vicinity, the No Project Alternative would also not result in any impact under these land use subtopics. Unlike the Proposed Project, this alternative would not conflict with any applicable land use plan, policy, or regulation with jurisdiction over the project. Unlike the proposed project, this alternative would not further existing plans and policies like local, regional and State policies that encourage the provision of public access to the waterfront.

Compared to the Proposed Project, which would have less-than-significant land use impacts, as described in Section 4.B, Land Use and Land Use Planning, the No Project Alternative would not have any project-level impacts, and would not contribute considerably to any significant cumulative impact related to land use and land use planning.

POPULATION AND HOUSING

Under the No Project Alternative, none of the residential units, commercial development, or RALI uses under either the Maximum Residential Scenario or Maximum Commercial Scenario would be developed on the project site. The number of employees on the project site would be expected to remain essentially the same as under existing conditions. Like the Proposed Project, no housing units or current on-site employees would be displaced. Unlike the Proposed Project, there would no increase in population in the area, either directly or indirectly. Unlike the Proposed Project, there would be no increase in demand for additional housing or for construction of new housing units. Compared to Proposed Project, which would have less-than-significant population and housing impacts as described in Section 4.C, Population and Housing, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to population and housing.

CULTURAL RESOURCES

Archeological Resources

Under the No Project Alternative, existing archeological resources would not be affected. Since the No Project Alternative would not result in any excavation or ground disturbance, there would not be any disturbance of potential archeological deposits or human remains. Significant archeological impacts would not occur. The required mitigation measures identified for the Proposed Project (M-CR-1a: Archeological Testing, Monitoring, Data Recovery, and Reporting and M-CR-1b: Interpretation) would not be applicable to this alternative. Compared to the Proposed Project, which would have less-than-significant archeological resources impacts with mitigation as described in Section 4.D, Cultural Resources, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to archeological resources.

Historic Architectural Resources

Under the No Project Alternative, existing conditions at the Pier 70 project site would not change. The 35-acre project site, which contains approximately 351,800 gsf of mostly vacant buildings and facilities would be retained in its current condition. There would be no demolition or rehabilitation of contributors to the UIW Historic District under the No Project Alternative. (Building 117 within the project site would be demolished as part of a separate 20th Street

Historic Core Building 117 Project, Case No. 2016-000346E.) In addition, there would be no new infill construction in the UIW Historic District, or improvements to infrastructure or open spaces. The less-than-significant impacts with mitigation associated with the demolition of contributing buildings 11, 15, 16, 19, 25, 32, and 66, and the alterations to the Irish Hill contributing landscape feature, as well as the rehabilitation of historic Buildings 2, 12, and 21, would not occur under the No Project Alternative. Compared to the Proposed Project, which would have less-than-significant impacts on historic architectural resources with mitigation as described in Section 4.D, Cultural Resources, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to historic architectural resources.

TRANSPORTATION AND CIRCULATION

The No Project Alternative would not result in any changes to the existing transportation network on the project site; no new streets or sidewalks would be constructed and no improvements to existing streets or sidewalks would occur. No new traffic signals would be installed at intersections near the project site. The proposed bicycle lanes and signage would not be installed, and the Bay Trail/Blue Greenway would continue to be designated on Illinois Street rather than relocated to 20th Street and the waterfront on the project site. No shuttle service would be provided. Because land uses would not change, no new person trips and no new vehicle trips would be generated on the Pier 70 project site or in the transportation study area (Figure 4.E.1: Transportation Study Area and Study Intersections, in Section 4.E, Transportation and Circulation, p. 4.E.2, shows the transportation study area). No changes to emergency access to the project site would occur. No construction travel would be generated. The No Project Alternative would not have any transportation or circulation impacts and would make no transportation network improvements.

The transit capacity utilization standard would not be exceeded on the 48 Quintara/24th Street Muni bus route under the No Project Alternative, and the significant unavoidable project-specific and cumulative impact on transit identified in Impact TR-, and Impact C-TR-4 for the Proposed Project would not occur. Mitigation Measures M-TR-5 and M-C-TR-4, to increase capacity on this bus route, would not be applicable. Because there would not be a substantial increase in pedestrian trips into and out of the project site, the existing barriers to accessible pedestrian travel along Illinois Street between 20th and 22nd streets would remain, but would not result in new significant impacts on pedestrians and Mitigation Measure M-TR-109 would not be applicable. No new loading demand would be generated and M-TR-12a and M-TR-12b would not be applicable.

Compared to the Proposed Project, which would have significant and unavoidable transportation and circulation impacts as described in Section 4.E, Transportation and Circulation, the No

Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to transportation and circulation.

NOISE AND VIBRATION

Under the No Project Alternative, the significant and unavoidable construction-related noise increases and vibration effects, significant operational noise increases from stationary equipment, and significant traffic noise increases on local roadways in the project vicinity that are attributable to the project would not occur. In addition, noise compatibility issues posed by the proximity of proposed residential uses to existing and future industrial and commercial uses would also be avoided. The required mitigation measures identified for the Proposed Project would not be applicable to this alternative. Compared to the Proposed Project, which would have significant and unavoidable noise impacts as described in Section 4.F, Noise and Vibration, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to noise and vibration.

AIR QUALITY

The No Project Alternative does not include demolition or construction activities on the project site, and, consequently, no new sources of air pollutants would be added. Existing stationary sources of air pollution near the project site and major roadways contributing to air pollution in the project vicinity would remain as in existing conditions. Because potential construction air quality impacts that would occur under the Proposed Project would not occur under this alternative, the construction emissions minimization plan mitigation measure identified for the Proposed Project would not be applicable to this alternative. Compared to the Proposed Project, which would have significant and unavoidable impacts related to air quality as described in Section 4.G, Air Quality, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to air quality and none of the operational or construction-related mitigation measures would be required. Because there would be no increase in criteria air pollutant or TAC emissions associated with the No Project Alternative, it would be consistent with the goals of the existing 2010 Clean Air Plan of the BAAQMD and would therefore have a less than significant impact with regard to conflicts with, or obstruction of, the applicable air quality plan. In addition, the No Project Alternative would not create any new source of odors.

GREENHOUSE GAS EMISSIONS

Under the No Project Alternative, there would be no new sources of greenhouse gas (GHG) emissions. The existing uses and continued operation of uses on the project site would be subject to the requirements consistent with the City of San Francisco's GHG Reduction Strategy, as

applicable. Like the Proposed Project, which would have less-than-significant GHG impacts as described in Section 4.H, Greenhouse Gas Emissions, the No Project Alternative would not result in a significant GHG impact and would not contribute considerably to a cumulative GHG impact.

WIND AND SHADOW

Wind

Under the No Project Alternative, there would be no change in existing wind conditions on or around the project site. The No Project Alternative would not result in the construction of any new buildings or structures that would intercept overhead wind currents, redirect them downward, and alter ground-level wind conditions. Compared to the Proposed Project, which would have less-than-significant wind impacts as described in Section 4.I, Wind and Shadow, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to wind.

Shadow

Under the No Project Alternative, there would be no change in existing sunlight conditions on any of the nearby open spaces or public sidewalks. Compared to the Proposed Project, which would have less-than-significant shadow impacts as described in Section 4.I, Wind and Shadow, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to shadow.

RECREATION

Under the No Project Alternative, there would be no new residential units or commercial and RALI space that would result in an increase in residential, employee, or visitor population at the project site, unlike the Proposed Project. Therefore, there would be no incremental increase in demand for and use of existing adjacent parks, recreational facilities, nearby City recreational facilities, or regional, State, and Federal recreational facilities under this alternative, unlike the Proposed Project. Compared to the Proposed Project, which would have less-than-significant recreation impacts, as described in Section 4.J, Recreation, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to recreation.

UTILITIES AND SERVICE SYSTEMS

Under the No Project Alternative, existing uses at the project site would not change. There would be no increase in the potable water or wastewater demands, and no need for the construction of related infrastructure, including the new components of the combined sewer system and the

20th Street Pump Station that would be constructed under the Proposed Project. Both individually, and on a cumulative basis, the existing wastewater flows would remain within the capacity of the existing wastewater infrastructure and the Southeast Water Pollution Control Plant (SEWPCP). Because there would be no development triggering the City's Stormwater Management Requirements and Design Guidelines, there would be no reduction in stormwater flows to the combined sewer system as would occur under the Proposed Project. There would be no change in the amount of stormwater runoff and no need for the construction of new stormwater infrastructure. Compared to the Proposed Project, which would have less-than-significant utilities and service systems impacts as described in Section 4.K, Utilities and Service Systems, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to utilities and service systems.

PUBLIC SERVICES

Under the No Project Alternative, there would be no new residential units or commercial and RALI space that would result in an increase in residential, employee, or visitor population at the project site, unlike the Proposed Project. The project site is currently adequately served by existing police protection, fire protection and emergency medical services, public school facilities, and public libraries. Compared to the Proposed Project, which would have less-than-significant public services impacts as described in Section 4.L, Public Services, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to public services.

BIOLOGICAL RESOURCES

Under the No Project Alternative, existing conditions at the Pier 70 project site would not change. The less-than-significant impacts with mitigation associated with rehabilitation of existing buildings within the project site or building demolition or construction with potential to adversely affect resident or migratory terrestrial or aquatic special-status species would not occur under this alternative. No improvements to the existing shoreline protection, existing bulkhead, or stormwater outfalls requiring in-bay construction would occur under the No Project Alternative thus there would be no impact to jurisdictional waters, subtidal habitat, or special-status aquatic species using migratory corridors as compared to the Proposed Project. Compared to the Proposed Project, which would have less-than-significant biological resources impacts with mitigation as described in Section 4.M, Biological Resources, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to biological resources.

GEOLOGY AND SOILS

Under the No Project Alternative, existing conditions at the Pier 70 project site would not change. There would be no new construction that could be exposed to seismic hazards, and there would be no increase in site uses that could expose more people to seismic hazards. Existing Buildings 2, 12, and 21 would not be improved, as would occur under the Proposed Project, and would potentially be subject to greater damage in the event of a major earthquake. Because there would be no land disturbance under this alternative, there would be no increase in the potential for soil erosion, no change in site topography, no potential to create an unstable slope, and no potential to encounter paleontological resources. The Proposed Project includes Mitigation Measure M-GE-3b: Signage and Restricted Access to Piers to restrict access to the existing dilapidated pier at the project site. The No Project Alternative would not include this mitigation requirement. The pier is currently fenced off and public access to the pier is restricted. The Proposed Project would remove existing barriers to waterfront access necessitating this mitigation measure. Compared to the Proposed Project, which would have less-than-significant geology and soils impacts with mitigation, as described in Section 4.N, Geology and Soils, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to geology and soils.

HYDROLOGY AND WATER QUALITY

Under the No Project Alternative, existing conditions at the Pier 70 project site would not change. Because there would be no land disturbance under this alternative, there would be no increase in the potential for soil erosion and related water quality effects and no groundwater dewatering would be required. Similarly, there would be no changes at the project site that would result in an alteration of drainage patterns that could increase the potential for erosion, siltation, or flooding on or off site. No shoreline improvements or new stormwater infrastructure would be constructed, and the combined sewer discharge (CSD) structures would not be repaired. Therefore, there would be no in-bay construction and related water quality effects. In addition, this alternative would not result in any new wastewater or stormwater discharges or the addition of any stormwater pollutants that could affect water quality. The alternative would not require construction of a new 20th Street Pump Station, and would not affect the frequency of CSDs from the 20th Street sub-basin of the City's combined sewer system. Because the site uses would not change, there would be no increase in littering which could affect San Francisco Bay water quality.

There would be no impact related to depletion of groundwater resources or interference with groundwater recharge because there would be no groundwater use and no increase in the amount of impervious surfaces. No shoreline protection features would be constructed under this

alternative, and the project site would remain subject to future flooding as a result of sea level rise and flooding in the event of a tsunami as for existing conditions.

Compared to the Proposed Project, which would have less-than-significant hydrology and water quality impacts with mitigation as described in Section 4.O, Hydrology and Water Quality, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to hydrology and water quality or flooding as a result of sea level rise or tsunami.

HAZARDS AND HAZARDOUS MATERIALS

Under the No Project Alternative, existing conditions at the Pier 70 project site would not change. Because there would be no land disturbance or building demolition under this alternative, there would be no potential to encounter hazardous building materials during demolitions, no potential to encounter PCBs as a result of transformer removal, no uses of hazardous materials during construction, and no potential to encounter hazardous materials in the soil and groundwater during construction. Implementation of this alternative would not include any construction that would generate diesel particulate matter (DPM) or dust containing naturally-occurring asbestos or metals within one-quarter mile of a school.

Existing and future occupants of the project site would be protected from exposure to hazardous materials in the soil and groundwater through implementation of the Pier 70 Master Plan Area Risk Management Plan and Hoedown Yard Site Management Plan. There would be no new site uses under the No Project Alternative; therefore, there would be no impacts related to the use of hazardous materials during operation, no changes in the street network or traffic patterns that could affect emergency response, and no increase in the risk of fires.

Compared to the Proposed Project, which would have less-than-significant impacts related to hazards and hazardous materials with mitigation as described in Section 4.P, Hazards and Hazardous Materials, the No Project Alternative would not have any project-level impacts, and would not contribute to any cumulative impact related to hazards and hazardous materials.

MINERAL AND ENERGY RESOURCES

There are no known mineral resources within the project site. Similar to the Proposed Project, the No Project Alternative would have no impact on a mineral resource and would not contribute to a significant cumulative impact on a mineral resource.

Under the No Project Alternative, there would be no change in the level of energy consumption within the project site. Like the Proposed Project, under the No Project Alternative there would be no activities which would result in the use of wasteful or large amounts of fuel, water or

energy. Compared to the Proposed Project, which would have less-than-significant energy resources impacts as described in Section 4.Q, Mineral and Energy Resources, the No Project Alternative would continue existing energy consumption levels within the project site and would not have any project-level impacts or contribute considerably to any cumulative impact related to energy resources.

AGRICULTURAL AND FOREST RESOURCES

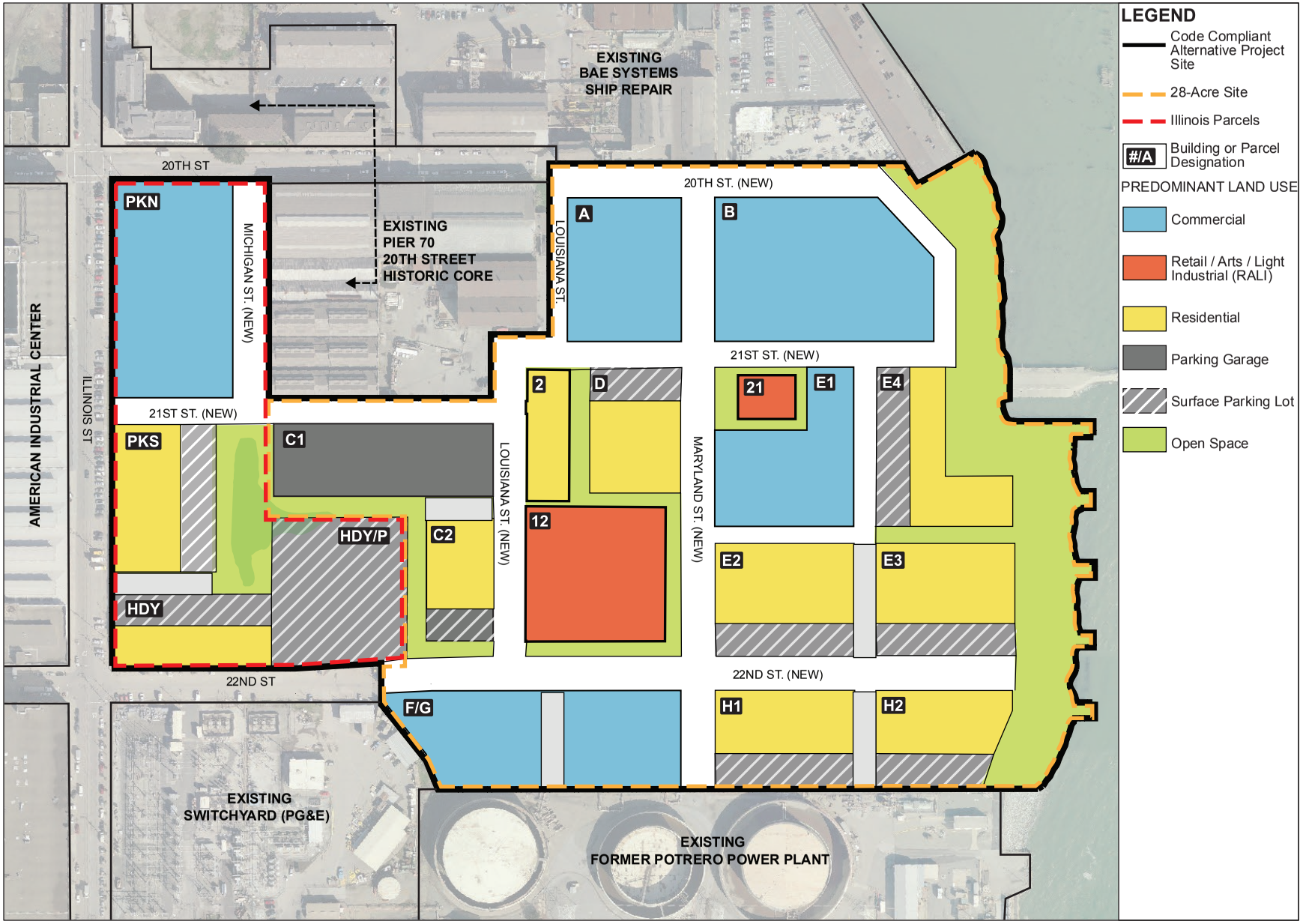
As with the Proposed Project, the No Project Alternative would not convert farmland, conflict with agricultural or forest land zoning or a Williamson Act contract, nor result in a loss or conversion of forest land or farmland. Therefore, like the Proposed Project, which would have no impact on agricultural and forest resources, as described in Section 4.R, Agricultural and Forest Resources, the No Project Alternative would not have any impacts related to agricultural and forest resources.

C. CODE COMPLIANT ALTERNATIVE

Description

Unlike the Proposed Project, the Code Compliant Alternative would meet applicable provisions of the Planning Code and would not require any Planning Code amendments nor establishment of an SUD. Under this alternative, the project site would remain in M-2 (Heavy Industrial) and P (Public) Zoning Districts and would include approximately 1,881,360 gsf of development, about 45 percent less than under the Proposed Project. (See Figure 7.1: Code Compliant Alternative – Land Use Plan.) Under this alternative, the project site would remain within the existing Height and Bulk Districts of 65-X and 40-X. Voter approval, pursuant to Proposition B, would not be required under the Code Compliant Alternative because changes to the height districts would not be proposed. (See Figure 7.2: Code Compliant Alternative – Maximum Height Plan.)

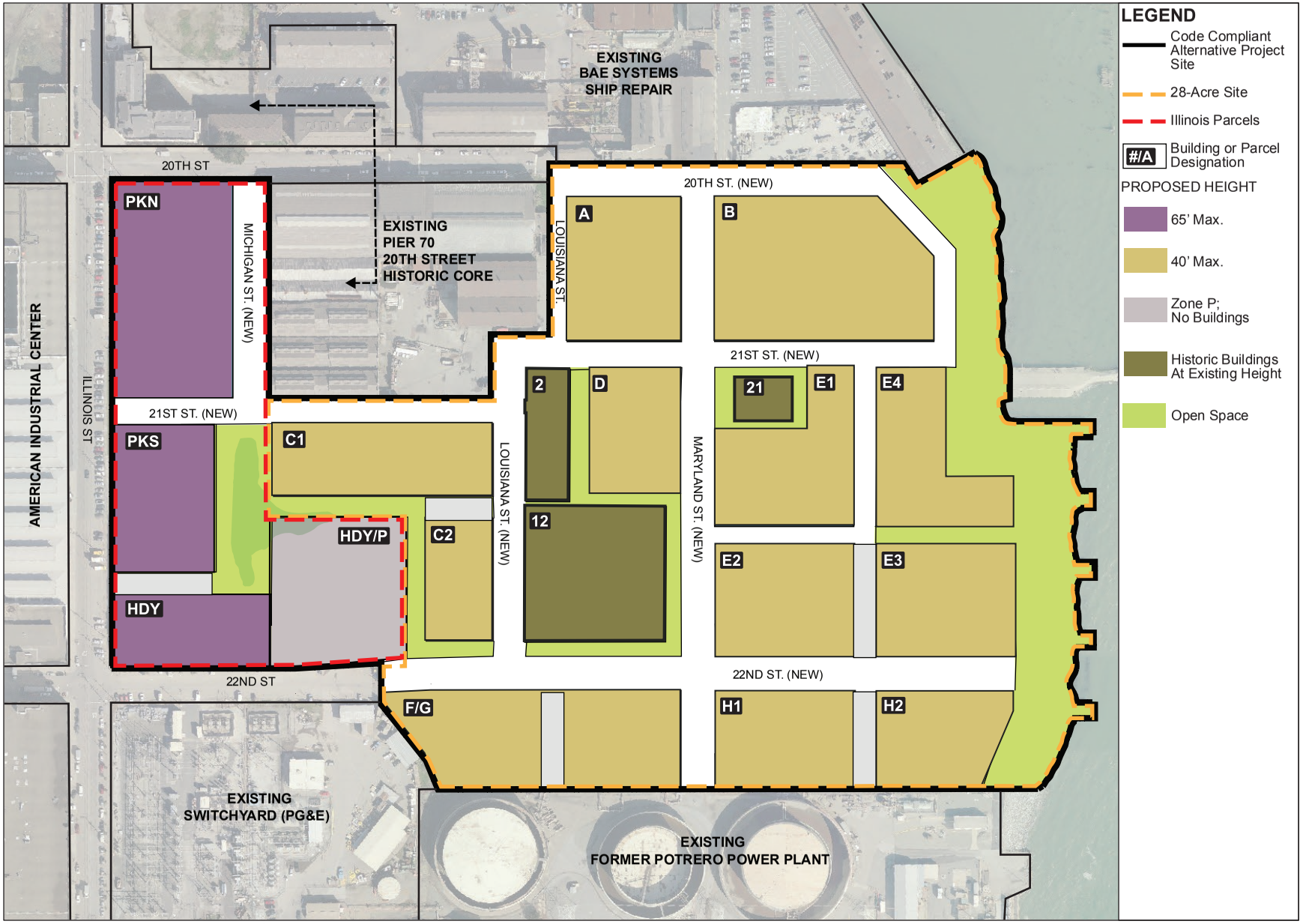
The Code Compliant Alternative would include 590 residential units totaling 519,950 gsf, 1,162,260 gsf of commercial (office) use, 156,780 gsf of retail use, and 42,370 gsf of RALI uses. The Code Compliant Alternative would provide 150 on-street vehicle parking spaces and 985 off-street spaces located on several surface parking lots on the site. Under this alternative, 5.76 acres of public open space would be constructed, including promenade and terrace areas along the waterfront, an Irish Hill playground area, and a plaza and market square around Building 12. Unlike the Proposed Project, this alternative does not include the Maximum Residential Scenario and the Maximum Commercial Scenario as optional development scenarios.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 7.1: CODE COMPLIANT ALTERNATIVE - LAND USE PLAN



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 7.2: CODE COMPLIANT ALTERNATIVE - MAXIMUM HEIGHT PLAN

Like the Proposed Project, this alternative would include a Design for Development document comparable to that of the Proposed Project, but would apply specifically to the height districts, use program, and site plan for streets, configuration of parcels, and open spaces under this alternative. As with the Proposed Project, the Design for Development under this alternative would establish standards and guidelines for the rehabilitation of historic buildings, buildable zones for infill construction, and would contain project-wide as well as location-specific massing and architecture requirements that would govern the design of infill construction within the project site to ensure architectural compatibility with historic buildings within the UIW Historic District.

Under the Code Compliant Alternative, 237,800 gsf located in Buildings 2, 12, and 21 on the project site would be retained and rehabilitated in accordance with *Secretary of the Interior's Standards*. As with the Proposed Project, the northern spur of the Irish Hill remnant would be removed to allow for the construction of 21st Street. Also, as under the Proposed Project, Building 21 would be relocated about 75 feet to the southeast. The remaining seven structures on the project site (Buildings 11, 15, 16, 19, 25, 32, and 66), containing 123,200 gsf, would be demolished.

Similar to the Proposed Project, the Code Compliant Alternative includes construction of transportation and circulation improvements. Under this alternative, the following transportation and circulation improvements would be implemented: construction of a new 21st Street, reconstruction of 20th and 22nd streets, and construction of new Louisiana and Maryland streets. All new and reconstructed streets would be built with sidewalks. As under the Proposed Project, the Code Compliant Alternative would include the same bicycle circulation improvements (Bay Trail extension, Class II and Class III facilities on internal streets, and a bikeshare location). The Code Compliant Alternative would include the same Transportation Demand Management (TDM) program as the Proposed Project, with exception of those items that pertain only to residential tenants. A TDM program would include the following: establishment of a Transportation Management Association (TMA) that employs an on-site transit coordinator, operation of a shuttle system, maintenance of a TMA website with real-time transit information, distribution of educational documents, coordination of ride-matching services, enrollment in Emergency Ride Home program, employment of a "district" parking strategy, unbundled residential and commercial parking, provision of car-share parking spaces, metering of on-street parking, and parking wayfinding signage across the site.

Under this alternative, new and upgraded utilities and infrastructure would be constructed, including a new 20th Street Pump Station. A combined sewer and stormwater system would be built, similar to Option 1 under the Proposed Project, but it would have slightly different alignments due to different building and roadway siting and locations. Unlike the Proposed

Project, this alternative does not include variants. The Code Compliant Alternative would further some of the project sponsors' objectives, as shown in Table 7.16: Ability of Alternatives to Meet Project Objectives, pp. 7.92-7.95.

The Code Compliant Alternative includes about 47,962 cubic yards of off-haul of excavated materials and about 8,900 cubic yards of clean fill import. This alternative includes construction of an engineered berm along the eastern property boundary with an approximately 3:1 slope and a maximum height of approximately four feet to address projected sea level rise flooding risks. Shoreline protection improvements, including placing riprap along the water's edge, under this alternative would be similar to those under the Proposed Project. Implementation of this alternative would take place over a period of 11 years, similar to the Proposed Project, and in up to four phases (as opposed to five for the proposed project).

Under this alternative, an exchange of land under the Public Trust Exchange Agreement would occur in order to clarify the Public Trust status of portions of Pier 70 and free some portions of the project site from the Public Trust while committing others to the Public Trust.

Impacts of the Code Compliant Alternative

LAND USE AND LAND USE PLANNING

Under the Code Compliant Alternative, the number of residential units would be considerably reduced to 590 units (80.5 percent fewer units than under Maximum Residential Scenario and 64.1 percent fewer units than under the Maximum Commercial Scenario). The amount of commercial development under the Code Compliant Alternative (in gsf) would be roughly comparable to that of the Proposed Project under the Maximum Residential Scenario (about 5.4 percent more) and considerably reduced from the Maximum Commercial Scenario (about 49 percent less). The amount of RALI development under the Code Compliant Alternative would be considerably reduced from that of the Proposed Project under both the Maximum Residential Scenario (about 58.5 percent less) and the Maximum Commercial Scenario (about 59.1 percent less).

Like the Proposed Project, which would have less-than-significant land use impacts as described in Section 4.B, Land Use and Land Use Planning, this alternative would not divide an established community and would not conflict with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect, such that a substantial adverse physical change in the environment related to Land Use would result. As such, the Code Compliant Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to land use and land use planning.

POPULATION AND HOUSING

Under the Code Compliant Alternative, the residential and employee population within the project site would be considerably reduced compared to the Proposed Project. Like the Proposed Project, which would have less-than-significant population and housing impacts as described in Section 4.C, Population and Housing, this alternative would not induce substantial population growth and would not displace any existing housing units or current on-site employees. As such, the Code Compliant Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to population and housing.

CULTURAL RESOURCES

Archeological Resources

Compared with the Proposed Project, the Code Compliant Alternative would have less potential for impacts on archeological resources (including human remains that may be considered archeological resources) due to less soils disturbance under the reduced grading program under this alternative and a reduced overall construction program. However, under this alternative, potential impacts related to archeological resources would be substantially similar in character to those described for the Proposed Project in Section 4.D, Cultural Resources (disturbance of archeological resources, human remains, and tribal cultural resources, if such resources are present within the project site, and cumulative impacts). Mitigation Measure M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting, and Mitigation Measure M-CR-1b: Interpretation, identified and described for the Proposed Project, would also be applicable to this alternative to ensure that potential project-level impacts on archeological resources, if present within the project site, would be less than significant.

Like the Proposed Project which would have less-than-significant archeological resources impacts with mitigation as described in Section 4.D, Cultural Resources, this alternative, with mitigation, would not cause a substantial adverse change in the significance of a historical resource or archeological resource, or disturb human remains. As such, the Code Compliant Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to archeological resources.

Historic Architectural Resources

The Code Compliant Alternative would meet applicable provisions of the Planning Code, and the project site would remain within the existing Height and Bulk Districts of 65-X for the Illinois Parcels and 40-X for the 28-Acre Site. Similar to the Proposed Project, seven contributors to the

UIW Historic District would be demolished (Buildings 11, 15, 16, 19, 25, 32, and 66) and historic Buildings 2, 12 and 21 would be retained and rehabilitated in accordance with Secretary of the Interior Standards. (Building 117 within the project site would be demolished as part of a separate 20th Street Historic Core Building 117 Project, Case No. 2016-000346E.) As with the proposed project, the northern spur of Irish Hill (a contributing landscape feature of the UIW Historic District) would be removed. Also, as under the Proposed Project, Building 21 would be relocated about 75 feet to the southeast. The Code Compliant Alternative would include approximately 1,881,360 gsf of new infill development, about 45 percent less development than under the Proposed Project.

Similar to the Proposed Project, the less-than-significant impact associated with demolition of contributors to the UIW Historic District would be less-than-significant under this alternative. Improvement Measures I-CR-4a and 4b, Documentation and Public Interpretation would also apply to this alternative.

Similar to the Proposed Project, the significant impact under Impact CR-5 associated with rehabilitation of contributing buildings would also be significant under this alternative. As with the Proposed Project, Mitigation Measure M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria, would also apply to this alternative to reduce the impact of rehabilitation to a less-than-significant level.

The indirect impacts of new infill construction within the UIW Historic District under this alternative would be reduced when compared to the Proposed Project, as there would be about 45 percent less development under this alternative. The height of new infill development would be reduced from a maximum of 90 feet in many project site areas under the Proposed Project to 40 feet under this alternative, which would allow for new buildings to be approximately the same in height, or shorter than, the historic buildings to be retained; in particular, Building 2, at nearly 80 feet in height, would be taller than any of the new development, while Building 12, at nearly 60 feet, would be taller than most new development and similar in height to new buildings on the Illinois Parcels, and Building 21, at 44 feet, would be comparable in height to new development except on the Illinois Parcels. This would allow for these historic buildings to maintain a somewhat greater integrity of setting, in that they would be less obscured from public viewpoints on the project site, compared to conditions with the Proposed Project.

Similar to the Proposed Project, however, new infill development would have a less-than-significant impact on the UIW Historic District, with implementation of Mitigation Measures M-CR-11: Performance Criteria and Review Process for New Construction, which would also apply to this alternative. As with the Proposed Project, the impacts on the UIW Historic District associated with the grading plan, changes to historic landscape elements such as Irish Hill, the

demolition of non-contributory structures, and changes and additions to the network of streets and open spaces would also be less-than-significant under this alternative.

Like the Proposed Project, which would have less-than-significant historic architectural resources impacts with mitigation as described in Section 4.D, Cultural Resources, this alternative, with mitigation, would not cause a substantial adverse change in the significance of a historic architectural resource. As such, the Code Compliant Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to historic architectural resources.

TRANSPORTATION AND CIRCULATION

The Code Compliant Alternative would include construction of the same transportation network improvements as described for the Proposed Project. Transportation Demand Management measures would be similar to those of the Proposed Project, except without those measures that are specific to residential units, as noted above.

Trip Generation

The travel demand for the Code Compliant Alternative was calculated using methodologies and assumptions similar to those used for the Proposed Project and is based on the 2002 *San Francisco Transportation Impact Analysis Guidelines for Environmental Review* (*SF Guidelines*), and information to account for the mixed-use qualities and scale of the development program.[1] Thus, as for the Proposed Project, the person trip calculations for the Code Compliant Alternative take into account person trips internal to the project site (e.g., trips from an office to a retail establishment on the site) as well as trips to or from points outside of the project site. With fewer dwelling units and less office and RALI uses, the Code Compliant Alternative would generate fewer person trips and fewer vehicle trips than the Proposed Project.

Table 7.2: Code Compliant Alternative Trip Generation – Internal and External Person-Trips, compares person trips generated by each of the two scenarios analyzed for the Proposed Project to those generated by the Code Compliant Alternative. As shown, the Code Compliant Alternative would generate just under 40 percent of the total daily person-trips that the Proposed Project would generate under either the Maximum Residential Scenario or Maximum Commercial Scenario.

[1] The analysis and results presented for the Code Compliant Alternative are based on the information in the Fehr & Peers memorandum to Manoj Madhavan, Transportation Planner, regarding Pier 70 Alternatives Analysis, Transportation and Circulation, December 9, 2016.

Table 7.2: Comparison of Proposed Project and Code Compliant Alternative Trip Generation - Internal + External Person Trips

Scenario	Number and Proportion of Person-Trips[1]					
	Daily		AM Peak Hour		PM Peak Hour	
Proposed Project Maximum Residential Scenario						
Internal	24,300	18.5%	1,796	16.9%	3,643	23.0%
External	107,059	81.5%	8,809	83.1%	12,227	77.0%
Total	**131,359**	**100.0%**	**10,605**	**100.0%**	**15,870**	**100.0%**
Proposed Project Maximum Commercial Scenario						
Internal	14,099	10.0%	1,046	9.7%	2,844	18.2%
External	127,266	90.0%	9,721	90.3%	12,808	81.8%
Total	**141,365**	**100.0%**	**10,767**	**100.0%**	**15,652**	**100.0%**
Code Compliant Alternative						
Internal	4,882	9.6%	311	9.4%	902	18.2%
External	46,036	90.4%	2,987	90.6%	4,048	81.8%
Total	**50,918**	**100.0%**	**3,298**	**100.0%**	**4,950**	**100.0%**

Note:

[1] Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2016

As shown in Table 7.3: External Person Trips by Mode – Code Compliant Alternative, transit trips generated by the Code Compliant Alternative also would be reduced: 1,025 a.m. peak hour trips compared to the range of 2,665–2,818 a.m. peak hour transit trips under the Proposed Project scenarios; 1,042 p.m. peak hour trips compared to the range of 2,893–2,809 p.m. peak hour transit trips under the Proposed Project scenarios; and 10,156 daily transit trips compared to the range of 22,423–26,018 under the Proposed Project scenarios.

Similarly, the vehicle trips generated by the alternative would be approximately one-third the amount generated by either the Maximum Residential Scenario or the Maximum Commercial Scenario under the Proposed Project, as shown in Table 7.4: Vehicle Trip Generation - Code Compliant Alternative.

Construction Impacts

The types of travel generated by construction activities for this alternative would be similar to those of the Proposed Project, but with approximately 45 percent less development, would result in fewer total truck trips over the multi-year construction period. Localized transportation impacts during construction would remain less than significant, as for the Proposed Project. Improvement Measure I-TR-A: Construction Management Plan, would still be applicable to the alternative.

Table 7.3: Comparison of Proposed Project and Code Compliant Alternative External Person Trips by Mode

Scenario	Number and Proportion of Person-Trips[1]					
	Daily		AM Peak Hour		PM Peak Hour	
Proposed Project - Maximum Residential Scenario						
Auto Person Trips	54,109	50.5%	4,564	51.8%	6,251	51.1%
Transit Person Trips	22,423	20.9%	2,665	30.3%	2,893	23.7%
Walk/Bike/Other Person Trips	30,527	28.5%	1,579	17.9%	3,083	25.2%
Total	**107,059**	**100.0%**	**8,808**	**100.0%**	**12,227**	**100.0%**
Proposed Project - Maximum Commercial Scenario						
Auto Person Trips	63,827	50.2%	5,087	52.3%	6,632	51.8%
Transit Person Trips	26,018	20.4%	2,818	29.0%	2,809	21.9%
Walk/Bike/Other Person Trips	37,421	29.4%	1,816	18.7%	3,366	26.3%
Total	**127,266**	**100.0%**	**9,721**	**100.0%**	**12,807**	**100.0%**
Code Compliant Alternative						
Auto Person Trips	23,054	50.1%	1,593	53.3%	2,119	52.3%
Transit Person Trips	10,156	22.1%	1,025	34.3%	1,042	25.7%
Walk/Bike/Other Person Trips	12,826	27.9%	369	12.4%	888	21.9%
Total	**46,036**	**100.0%**	**2,987**	**100.0%**	**4,049**	**100.0%**

Note:

[1] Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2015

Table 7.4: Comparison of Proposed Project and Code Compliant Alternative Vehicle Trip Generation

Scenario	Number of Vehicle Trips[1]		
	Daily	AM Peak Hour	PM Peak Hour
Proposed Project - Maximum Residential Scenario			
In	15,508	1,954	1,885
Out	15,508	1,300	2,045
Total	**31,015**	**3,254**	**3,930**
Proposed Project - Maximum Commercial Scenario			
In	17,395	2,509	1,461
Out	17,395	930	2,462
Total	**34,790**	**3,439**	**3,923**
Code Compliant Alternative			
In	6,384	938	417
Out	6,384	237	930
Total	**12,767**	**1,175**	**1,347**

Note:
[1] Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2016

Operational Impacts

VMT Impacts

VEHICLE MILES TRAVELED ASSESSMENT

The average VMT per capita for individual uses would be the same for the Code Compliant Alternative as for the Proposed Project. For residential development, the regional average daily household VMT per capita is 17.2. For office and retail development, regional average daily work-related VMT per employee is 19.1 and 14.9, respectively. The existing average daily VMT per capita are 8.8, 14.6, and 10.8 for households, office employees, and retail visitors, respectively, for the transportation analysis zone where the project site is located.

Given that the project site is located in an area where the existing VMT per capita is more than 15 percent below the existing regional average, similar to the Proposed Project, the retail, office, and open space uses associated with the Code Compliant Alternative are presumed not to result in substantial additional VMT and traffic impacts would be less than significant. Moreover, and also similar to the Proposed Project, the Code Compliant Alternative would be located within a close proximity to a high-quality transit station and corridor, which also leads to a presumption

that the Code Compliant Alternative would not result in substantial additional VMT and that for that reason as well, traffic impacts would be less than significant.

INDUCED TRAVEL

The Code Compliant Alternative would have a similar effect on induced travel as that described for the Proposed Project. As for the Proposed Project, the Code Compliant Alternative would include features that would slightly alter the transportation network. These features would be sidewalk widening on adjacent streets, on-street loading zones, curb cuts, and on-street safety strategies and intersection signalization. These features fit within the general types of transportation network projects identified that would not substantially induce automobile travel. Therefore, as described for the Proposed Project, impacts would be less than significant for the alternative.

Traffic Impacts

The roadway network for the Code Compliant Alternative would be the same as that in the Proposed Project. Therefore, no new traffic hazards would be created, and traffic impacts would be less than significant, as for the Proposed Project.

Transit Impacts

Impacts on transit capacity utilization associated with the Code Compliant Alternative would be somewhat less than with the Proposed Project. The Proposed Project was found to cause a significant and unavoidable (with mitigation) impact to local Muni Route 48 Quintara/24th Street by increasing ridership beyond the 85 percent utilization threshold during both AM and PM peak hours. All other transit impacts of the Proposed Project were found to be less than significant.

Using similar methodologies and assumptions as the analysis for the Proposed Project, transit trips for Project Alternatives were assigned to specific Muni routes. Since there were no significant impacts identified for the Proposed Project on any other Muni routes other than the 48 Quintara/24th Street, downtown screenlines, or regional screenlines and the Code Compliant Alternative would generate fewer transit trips than either of the Proposed Project scenarios, the alternative would also have a less-than-significant impact on those specific routes, the downtown screenlines, and regional screenlines. Therefore, this analysis focused solely on Muni Route 48 Quintara/24th Street to determine if the Project Alternatives would also cause significant impacts. As shown in Table 7.5: 48 Quintara/24th Street Capacity Utilization AM & PM – Baseline Plus Code Compliant Alternative, the Code Compliant Alternative would continue to increase ridership on Muni Route 48 beyond the 85 percent utilization threshold during the AM peak hour (outbound direction) and PM peak hour (inbound direction). The impact of the Code Compliant Alternative on Muni transit capacity would therefore be a significant and

Table 7.5: 48 Quintara/24th Street Capacity Utilization A.M. & P.M. – Comparison of Baseline Plus Proposed Project with Baseline Plus Code Compliant Alternative

	Baseline			Baseline Plus Project – Residential			Baseline Plus Project – Commercial			Baseline Plus Code Compliant Alternative		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization	Alternative Trips	Alt Ridership	Alt Utilization
AM												
Inbound	119	252	47%	149	268	**106%**	118	237	**94%**	31	150	60%
Outbound	199	252	79%	224	423	**168%**	319	518	**206%**	127	326	**129%**
PM												
Inbound	160	252	63%	211	371	**147%**	274	434	**172%**	112	272	**108%**
Outbound	213	252	**85%**	196	409	**162%**	161	374	**148%**	51	264	**105%**

Note:
Bold indicates capacity utilization of 85 percent or greater.

Source: Fehr & Peers 2016

unavoidable impact, similar to, although somewhat less than, the impact resulting from the Proposed Project scenarios.

Section 4.E, Transportation and Circulation, identified Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus route as needed, which would provide additional capacity for the 48 Quintara/24th Street route during the peak hours for the proposed project. As presented in Mitigation Measure M-TR-5, one option to accomplish this would be to add buses to this route [four (Maximum Residential) or six (Maximum Commercial) vehicles] during the peak hours, increasing the capacity of the route. Because the Code Compliant Alternative would generate fewer transit riders than the Proposed Project, the number of buses required to be added to this route would be fewer than that specified in Mitigation Measure M-TR-5. Mitigation Measure M-TR-5 would be modified to require the project sponsors to purchase three new Muni vehicles under the Code Compliant Alternative, increasing the capacity of the route by a similar amount to the Code Compliant Alternative's contribution to over-capacity conditions. Alternatively, as noted in Mitigation Measure M-TR-4, if preferable to SFMTA at the time of implementation, the Project Sponsor may contribute a comparable amount toward alternative measures to increase capacity along the route, such as transit priority treatments, a change in fleet to higher-capacity vehicles, or initiation of a new route providing comparable service. However, as with the Proposed Project, SFMTA has not formally agreed to operate increased service on this route, and therefore cannot guarantee implementation of this mitigation measure, and its feasibility remains uncertain. The other three options discussed under Mitigation Measure M-TR-5 – to fund the addition of articulated buses, increase travel speeds, or add a new route – would also require additional operational and construction funding throughout the route and beyond the impacts caused by the Code Compliant Alternative. Thus, because the feasibility of this mitigation measure is uncertain, the impact would remain significant and unavoidable with mitigation for the Code Compliant Alternative, similar to under the Proposed Project.

Pedestrian Impacts

The pedestrian network and improvements for the Code Compliant Alternative would be identical to those for the Proposed Project. Although the Code Compliant Alternative would generate fewer pedestrian trips to/from the project site, impacts would remain the same. Pedestrian facilities within the project site would be improved and would accommodate pedestrian travel generated by the alternative. Pedestrian travel to and from the project site would be expected to occur from Illinois Street at 20th Street to the north and 22nd Street to the south, as assumed for the Proposed Project. Several barriers to accessible pedestrian travel currently exist along these off-site pedestrian routes and particularly on the east side of Illinois Street, at the access points to the project site. Impacts on pedestrian circulation associated with the Code Compliant Alternative

would be considered significant. With implementation of Mitigation Measure M-TR-10: Improve pedestrian facilities on streets adjacent to and leading to the project site, identified for the Proposed Project under Impact TR-10, the impact associated with the Code Compliant Alternative would be reduced to a less-than-significant level. Improvement Measure I-TR-B: Queue Abatement would ensure that queues from on-site, off-street parking facilities would not extend into the public right-of- way, which would reduce potential conflicts with pedestrians. This mitigation measure includes sidewalk widening, construction of new traffic signals at Illinois Street/20th Street and Illinois Street/22nd Street, as well as the relocation of obstructions such as fire hydrants and power poles (if feasible) to ensure an accessible path of travel is provided to and from the project site.

Bicycle Impacts

The Code Compliant Alternative would increase bicycle trips in the project area, although to a lesser extent than either Proposed Project scenario. Bicyclists would continue to use various nearby bicycle routes to access the project site. The Code Compliant Alternative would not provide space for a bikeshare program, unlike the Proposed Project.

The Planning Code outlines specific requirements for Class 1 and Class 2 bicycle parking by land use, as summarized in Section 4.E, Transportation and Circulation, in Impact TR-11. Specifically, the Code Compliant Alternative would meet Planning Code requirements by providing 509 Class 1 and 110 Class 2 bicycle parking spaces.

The Code Compliant Alternative bicycle trips would be accommodated within the proposed street and bicycle network, both on the project site and along nearby existing bicycle routes, and the proposed bicycle parking supply would meet Planning Code requirements. Additionally, because the Code Compliant Alternative would generate fewer auto trips than the Proposed Project, it would result in fewer bicycle conflicts than the Proposed Project. Similar to the Proposed Project, bicycle impacts for the Code Compliant Alternative would be less than significant. No mitigation measures are required.

Loading Impacts

The delivery/service vehicle demand forecasts for the Code Compliant Alternative are based on the methodology and truck trip generation rates presented in the *SF Guidelines*. Delivery/service vehicle demand is based on the types and amount of land uses proposed for the alternative. The Code Compliant Alternative would generate a demand for 303 daily delivery/service vehicle-trips, consisting primarily of small trucks and vans. This corresponds to a peak demand for 15 loading spaces during an average hour of loading activities and 18 loading spaces during the

peak hour of loading activities. The Code Compliant Alternative would create less loading demand than either Proposed Project scenario.

The Code Compliant Alternative would provide loading facilities similar to the Proposed Project, with both on-street and off-street loading spaces. The Code Compliant Alternative would provide 15 loading spaces. This proposed loading supply would result in a shortfall of three loading spaces during the peak hour of loading. This shortfall is less than the 9-space shortfall under the Proposed Project; however, similar to the Proposed Project, loading impacts would be significant. Therefore, as with the Proposed Project, Mitigation Measure M-TR-12a, which directs the project's Transportation Coordinator to coordinate with building tenants and delivery services to minimize deliveries during AM and PM peak periods, and Mitigation Measure M-TR-12b, which directs the project sponsor to conduct on- and off-street commercial loading space utilization studies after Phase 1 to determine whether or not conversion of general purpose on-street parking spaces to commercial loading spaces is warranted, would be applicable to the Code Compliant Alternative. As with the Proposed Project, loading impacts could remain significant and unavoidable even with implementation of identified mitigation.

Emergency Access

Similar to the Proposed Project, the Code Compliant Alternative's internal streets would be designed to accommodate emergency vehicle access. Additionally, the Proposed Project's traffic generation would not substantially affect emergency vehicle access. Improvement Measure I-TR-C: Strategies to Enhance Transportation Conditions During Events would still apply and reduce the potential for project-related traffic – particularly during events at the project site – to interfere with emergency vehicle access. Because the Code Compliant Alternative would generate somewhat fewer vehicle trips than the Proposed Project, its effect on emergency vehicle circulation would be less and would therefore also create a less than significant impact to emergency vehicle access.

2040 Cumulative Impacts

The Proposed Project would not cause any significant cumulative impacts to VMT, induced travel, other traffic hazards, pedestrian or bicycle circulation, loading, emergency access, or construction, and thus the Code Compliant Alternative also would not result in a considerable contribution to significant cumulative impacts. This conclusion is based on the reduction in overall development under the alternative: it would result in substantially fewer residential units and approximately the same amount of commercial space and substantially less RALI space than the Maximum Residential Scenario.

As under the Proposed Project, the Code Compliant Alternative would cause a significant project-specific impact on local Muni route 48 Quintara/24th Street. The Proposed Project was found to contribute considerably to significant cumulative impacts on the 48 Quintara/24th Street and 22 Fillmore routes by increasing ridership more than 5 percent on routes expected to operate beyond the 85 percent utilization threshold during both AM and PM peak hours.

As shown on Table 7.6: 48 Quintara/24th Street Capacity Utilization AM & PM – Comparison of Cumulative with Proposed Project and Cumulative with Code Compliant Alternative, under the Code Compliant Alternative, Muni route 48 would operate beyond the 85 percent utilization threshold during both the AM (outbound only) and PM peak hours and also would contribute more than 5 percent to the total ridership, as for the Proposed Project. The contribution to this impact on Muni transit capacity would be considered significant. Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus route, would be modified under the Code Compliant Alternative to require the purchase of three new vehicles. This mitigation measure would reduce the Code Compliant Alternative's contribution to significant cumulative impacts on the 48 Quintara/24th Street to a less-than-significant level, and therefore, Mitigation Measure M-C-TR-4A: Increase capacity on the 48 Quintara/24th Street bus routes as needed, would not be required under the Code Compliant Alternative and no additional mitigation is necessary. Mitigation Measure M-C-TR-4B: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario, would not be required under the Code Compliant Alternative, because the 22 Fillmore bus route is projected to operate within the 85 percent capacity utilization threshold under cumulative conditions with the Code Compliant Alternative.

Parking

Due to the requirements within SB 743, which apply to the Proposed Project and the Code Compliant Alternative, San Francisco does not consider parking conditions to be environmental impacts as defined by CEQA for this project; however, Project parking demand/supply is of interest to the public and decision makers. Peak parking demand for the alternative was calculated using the same methodologies as for the Proposed Project. The Code Compliant Alternative would have a parking demand of approximately 3,308 spaces during the mid-day peak parking period, approximately 3,370 fewer than the parking demand from the Maximum Residential Scenario and 4,325 fewer than the Maximum Commercial Scenario. These differences are due to the lower intensity of land uses included in the Code Compliant Alternative than in either Proposed Project scenario.

The Code Compliant Alternative would provide approximately 150 on-street parking spaces and 985 off-street spaces, for a total of 1,135 parking spaces. This supply would not accommodate the calculated demand for parking on the project site. As for the Proposed Project, the lack of

Table 7.6: 48 Quintara/24th Street Capacity Utilization AM & PM – Comparison of Cumulative with Proposed Project and Cumulative with Code Compliant Alternative

	Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial			Cum. Plus Code Compliant Alternative		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization	Alternative Trips	Alt Ridership	Alt Utilization
AM												
Inbound	95	252	38%	149	244	**97%**	118	213	85%	31	126	50%
Outbound	244	252	**97%**	224	468	**186%**	319	563	**223%**	127	371	**147%**
PM												
Inbound	184	252	73%	211	395	**157%**	274	458	**182%**	112	296	**117%**
Outbound	175	252	69%	196	371	**147%**	161	336	**133%**	51	226	**90%**

Note:
Bold indicates capacity utilization of 85 percent or greater.

Source: Fehr & Peers 2016

parking may result in motorists looking for parking outside of the project site. However, existing and proposed residential permit parking areas in the vicinity would discourage spillover parking from the Code Compliant Alternative. Some drivers would shift to public transit or other modes of travel such as bicycling, use carshare facilities when a vehicle is needed, and would not own a car. It is possible that such a shift from automobile use to transit would add additional demand to public transit facilities.

NOISE AND VIBRATION

While the level of development under the Code Compliant Alternative would be less than the Proposed Project, the same types of building demolition, rehabilitation, and construction activities would still occur. Therefore, construction-related noise and vibration impacts under this alternative would be similar to the Proposed Project (Impacts NO-1, NO-2, and NO-3). However, there would be less excavated materials hauled off-site and less materials delivered to the site (i.e., fewer haul/delivery truck trips) than either scenario of the Proposed Project. Under this alternative, Mitigation Measures M-NO-1: Construction Noise Control Plan, M-NO-2: Noise Control Measures During Pile Driving, and M-NO-3: Vibration Controls Measures During Construction would still be required to reduce this alternative's construction-related impacts. Implementation of Mitigation Measures M-NO-1 and M-NO-3 would reduce construction-related noise and vibration impacts identified in Impacts NO-1 and NO-3 to less than significant. However, like the Proposed Project, pile driving noise impacts under this alternative (Impact NO-2) would still be significant and unavoidable even with implementation of Mitigation Measure M-NO-2.

Under this alternative, building heights would be less than 70 feet, so no roof-top emergency generators would be required. This would reduce the potential operational noise impacts from stationary equipment (Impact NO-4) compared to the Proposed Project. However, like the Proposed Project, Mitigation Measure M-NO-4 would still be required under this alternative for any other rooftop equipment such as HVAC equipment. Therefore, like the Proposed Project, this impact would be mitigated to a less-than-significant level under this alternative with implementation of Mitigation Measure M-NO-4.

Because the level of development under this alternative would be less than either scenario of the Proposed Project and less traffic would be generated, traffic noise increases would likewise be less. Table 7.7: Comparison of Existing Traffic Noise Increases from Proposed Project Versus Alternatives, lists the road segments where significant traffic noise increases were identified under either scenario of the Proposed Project (Impact NO-5) and then compares them to the significant traffic noise increases under the Code Compliant Alternative. Under the Proposed

Table 7.7: Comparison of Existing Traffic Noise Increases from Proposed Project Versus Alternatives

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline							Existing Use
		Baseline (2020)	With Proposed Project (Highest Levels Under Either Scenario)	Highest Project Changes	With Code Compliant Alternative	Code Compliant Alternative Change	With 2010 Pier 70 Alternative	2010 Pier 70 Alternative Change	
20th Street	Third to Illinois	59.7	65.1	**5.5**	62.9	**3.2**	63.3	**3.7**	Res/ School/ Ind
22nd Street	Tennessee to Third	58.4	61.6	**3.2**	59.8	1.4	60.0	1.7	Com/Res
	Third to Illinois	58.1	66.9	**8.7**	63.0	4.8	63.5	**5.4**	Ind
	East of Illinois	51.1	65.4	**14.3**	61.0	**9.9**	62.0	**10.9**	Ind
Illinois Street	20th to Driveway	58.9	64.7	**5.7**	61.5	2.6	61.9	3.0	Ind
	Driveway to 22nd	58.9	65.9	**7.0**	62.5	3.6	63.0	4.1	Ind
	South of 22nd	57.6	63.2	**5.7**	60.6	3.0	61.2	3.6	Ind

Notes:

Noise levels may vary by up to one-tenth of a decibel due to rounding. For comparison purposes, the roadway segments identified as "East of Third" and "West of Illinois" were consolidated into one row in this table (with highest increase presented) because they are the same roadway segment that extends from Third Street to Illinois Street. Noise levels in **bold** exceed either of the following threshold increases when compared to baseline noise levels: (1) an increase of 5 dBA or more, or (2) an increase of 3 dBA or more in areas where the existing or resulting noise increase exceeds acceptable (or satisfactory) levels for the affected noise sensitive (e.g., residential) use (see Figure 4.F.3, San Francisco Land Use Compatibility Chart for Community Noise, in Section 4.F, Noise and Vibration, p. 4.F.23).

Ldn/CNEL: CNEL and Ldn are 24-hour noise descriptors that add a 10-dBA penalty to all nighttime noise levels between 10:00 p.m. and 7:00 a.m. However, Ldn does not add the evening 5-dBA penalty between 7:00 p.m. and 10:00 p.m. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location from transportation noise sources.

dBA: A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies.

Source: Orion Environmental Associates, 2016

Project, significant traffic noise increases would occur on seven road segments, while under this alternative, only two road segments would have a significant traffic noise increase: 20th Street (Third to Illinois) and 22nd Street (east of Illinois Street).

Although the incremental increase on these two roadway segments under this alternative would be less than the Proposed Project, the Code Compliant Alternative would still substantially increase the ambient noise levels on one of the two segments by almost 10 dBA, a significant impact. The impact on one segment, 22nd Street (east of Illinois), under this alternative would be significant and unavoidable with mitigation (as opposed to three road segments under the Proposed Project that would be significant and unavoidable with mitigation) even with implementation of Mitigation Measure M-AQ-1f: Transportation Demand Management. Implementation of this mitigation measure could result in traffic reductions of up to 20 percent, and such reductions could provide noise level reductions of up to 1 dBA, which would be sufficient to reduce the projected 3.2 dBA increase on 20th Street (Third to Illinois) to less than significant levels. However, this mitigation measure would not reduce the estimated 9.9-dBA traffic noise increase on 22nd Street (east of Illinois) to a less-than-significant level.

Like the Proposed Project, this alternative would also result in a mix of residential, commercial, RALI uses, but the locations of these uses would vary slightly. This alternative is expected to have similar noise compatibility concerns with future noise levels as those identified for both scenarios of the Proposed Project (Impact NO-6), and would be less than significant with implementation of Mitigation Measure M-NO-6: Design of Future Noise-Sensitive Uses.

Since this alternative's construction-related noise and vibration impacts would be similar to those of the Proposed Project, construction-related cumulative noise impacts would be less than significant and this alternative's contribution to cumulative construction noise increases would also be like the Proposed Project, less than cumulatively considerable (Impact C-NO-1).

This alternative's contribution to cumulative operational traffic noise increases would be substantially less than the Proposed Project and slightly less than the 2010 Pier 70 Alternative. Table 7.8: Comparison of Cumulative Traffic Noise Increases from Proposed Project Versus Alternatives, compares significant cumulative traffic noise increases under this alternative to those identified for either scenario of the Proposed Project. When compared to 2040 cumulative noise levels (cumulative baseline), this alternative would avoid the significant cumulative noise increases that would occur under either scenario of the Proposed Project (Impact C-NO-2).

Table 7.8: Comparison of Cumulative Traffic Noise Increases from Proposed Project Versus Alternatives

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline											Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative +Project (Max Res)	Change from Baseline	Change from Cumulative	With Cumulative + Code Compliant Alternative	Change from Baseline (2020)	Change from Cumulative Baseline (2040)	With Cumulative + 2010 Pier 70 Alternative	Change from Baseline (2020)	Change from Cumulative Baseline (2040)	
Third Street	North of Harrison	67.1	67.3	67.7	0.6	0.4	67.5	0.5	0.2	67.6	0.5	0.3	Res/Com/Off
	Harrison to Bryant	67.8	68.3	68.6	0.8	0.3	68.5	0.7	0.2	68.5	0.8	0.2	Res/Com/Ind
	South of Bryant	67.5	67.9	68.3	0.8	0.4	68.2	0.6	0.3	68.2	0.7	0.3	Res/Com/Ind
	North of King	67.3	68.2	68.6	1.3	0.4	68.4	1.1	0.3	68.5	1.1	0.3	Res/Com
	King to Terry Francois	66.3	67.7	68.5	2.2	0.7	68.1	1.8	0.4	68.2	1.9	0.5	Ballpark/Res
	Terry Francois to Channel	65.6	67.4	68.2	2.6	0.8	67.9	2.2	0.4	68.0	2.3	0.5	Vacant/Parking
	Channel to Mission Rock	65.5	68.0	68.8	**3.3**	0.7	68.4	3.0	0.4	68.5	3.0	0.5	Res/Parking
	South of Mission Rock	65.3	67.7	68.5	**3.2**	0.8	68.1	2.8	0.4	68.2	2.9	0.5	UCSF/Inst/Res
	North of 16th	66.2	67.9	68.8	2.5	0.9	68.4	2.2	0.5	68.5	2.3	0.6	UCSF/Inst
	16th to Mariposa	66.4	67.5	68.7	2.3	1.2	68.1	1.7	0.6	68.2	1.8	0.7	Hospital/Ind
	Mariposa-20th	65.5	67.4	68.4	2.8	1.0	67.8	2.3	0.4	67.9	2.3	0.5	Res/Com/Ind
	20th to 22nd	66.0	68.4	69.2	**3.1**	0.8	68.9	2.9	0.5	69.0	3.0	0.6	Res/Com/Ind
	22nd to 23rd	66.4	68.2	69.9	**3.5**	1.7	69.0	2.6	0.8	69.1	2.7	0.9	Com/Res
	23rd to 25th	66.2	67.4	69.2	3.0	1.9	68.2	2.0	0.9	68.4	2.1	1.0	Ind
	25th to Cesar Chavez	66.3	67.7	69.1	2.8	1.4	68.3	2.0	0.6	68.4	2.1	0.7	Com/Ind
	South of Cesar Chavez	65.6	67.1	67.5	1.9	0.3	67.3	1.7	0.1	67.3	1.7	0.2	Ind
16th Street	West of Mississippi	64.5	65.9	66.5	2.0	0.6	66.2	1.7	0.3	66.3	1.7	0.3	Com/Ind
	East of Mississippi	65.7	66.8	67.5	1.8	0.7	67.1	1.4	0.3	67.1	1.4	0.3	Com/Ind
	West of Owens	65.7	66.9	67.6	1.9	0.7	67.2	1.5	0.3	67.2	1.6	0.3	UCSF/Inst.
	East of Owens	65.9	66.3	67.2	1.3	0.9	66.8	0.9	0.4	66.8	0.9	0.5	UCSF/Inst.
	West of Third	65.4	66.6	67.8	2.4	1.2	67.2	1.8	0.6	67.2	1.8	0.6	UCSF/Hospital
	East of Third	60.0	63.1	64.3	4.4	1.3	63.6	3.6	0.5	63.7	3.8	0.7	UCSF/Inst.
18th Street	West of Arkansas	54.7	54.9	55.8	1.1	0.9	55.3	0.5	0.3	55.4	0.6	0.4	Res/Ind
	East of Arkansas	55.4	56.6	57.2	1.9	0.6	56.8	1.5	0.2	56.9	1.5	0.3	Res/Com
	West of Texas	58.3	59.1	59.5	1.1	0.4	59.2	0.9	0.1	59.3	0.9	0.2	Res/Com
	Texas to Pennsylvania	58.5	59.1	59.4	0.9	0.3	59.2	0.7	0.1	59.2	0.7	0.1	Res/Com
	East of Pennsylvania	59.0	59.9	61.0	2.0	1.1	60.2	1.2	0.3	60.2	1.2	0.3	Off/Com
	West of Indiana	59.0	59.9	61.0	2.0	1.1	60.2	1.2	0.3	60.2	1.2	0.3	Ind
	East of Indiana	59.2	60.7	62.3	3.1	1.5	61.3	2.1	0.6	61.4	2.2	0.7	Ind

Table 7.8 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline											Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative +Project (Max Res)	Change from Baseline	Change from Cumulative	With Cumulative + Code Compliant Alternative	Change from Baseline (2020)	Change from Cumulative Baseline (2040)	With Cumulative + 2010 Pier 70 Alternative	Change from Baseline (2020)	Change from Cumulative Baseline (2040)	
20th Street	West of Third	58.9	59.8	60.7	1.8	0.9	60.4	1.5	0.7	60.5	1.6	0.7	Res/School/Ind
	East of Third	59.7	61.8	65.9	**6.2**	4.1	64.0	4.4	2.2	64.4	4.7	2.6	Ind
	West of Illinois	59.6	62.8	66.2	**6.7**	3.4	64.6	5.0	1.8	64.9	**5.3**	2.1	Ind
	East of Illinois	62.4	64.5	67.9	**5.5**	3.4	65.9	3.5	1.5	66.3	3.9	1.8	Ind
22nd Street	West of Indiana	59.4	61.8	63.5	4.1	1.8	62.5	3.1	0.7	62.6	3.2	0.9	Ind
	Indiana to Tennessee	58.8	61.1	63.1	4.4	2.0	61.9	3.2	0.8	62.1	3.3	1.0	Res
	Tennessee to Third	58.4	59.8	62.3	**4.0**	2.5	60.9	2.5	1.0	61.1	2.7	1.3	Com/Res
	East of Third	58.5	59.6	67.1	**8.6**	**7.5**	63.5	5.0	3.9	64.0	5.5	4.4	Ind
	West of Illinois	58.1	59.0	67.0	**8.9**	**8.0**	63.3	**5.2**	4.3	63.8	**5.7**	4.8	Ind
	East of Illinois	51.1	59.5	66.3	**15.2**	**6.7**	63.1	**12.0**	3.6	63.7	**12.6**	4.2	Ind
23rd Street	West of Third	56.5	58.4	60.9	4.4	2.6	59.5	3.0	1.1	59.7	3.2	1.3	Ind
	East of Third	54.9	58.3	60.5	**5.5**	2.1	59.2	4.3	0.9	59.4	4.5	1.1	Ind
	West of Illinois	53.6	58.4	60.5	**6.9**	2.1	59.2	**5.7**	0.9	59.4	**5.9**	1.1	Ind
	East of Illinois	50.9	53.2	53.2	2.3	0.0	53.2	2.3	0.0	53.2	2.3	0.0	Ind
25th Street	West of Pennsylvania	56.5	59.5	59.5	3.0	0.0	59.5	3.0	0.0	59.5	3.0	0.0	Res
	East of Pennsylvania	59.4	60.7	62.5	3.1	1.8	61.6	2.1	0.9	61.7	2.3	1.1	Ind
	West of Indiana	59.3	60.7	62.5	3.2	1.8	61.6	2.2	0.9	61.7	2.4	1.1	Ind
	East of Indiana	59.4	60.7	62.5	3.1	1.8	61.6	2.1	0.9	61.7	2.3	1.1	Ind
	West of Third	57.4	59.6	62.7	**5.3**	3.1	61.2	3.9	1.6	61.6	4.3	2.0	Ind
	East of Third	53.0	57.7	60.0	**7.0**	2.3	58.9	**5.9**	1.2	59.3	**6.3**	1.6	Ind
	West of Illinois	54.0	57.7	60.0	**6.0**	2.3	58.9	4.9	1.2	59.3	5.3	1.6	Ind
	East of Illinois	49.5	53.7	53.7	4.1	0.0	53.7	4.1	0.0	53.7	4.1	0.0	Ind
Cesar Chavez	West of Pennsylvania	65.1	65.5	66.7	1.6	1.2	66.0	0.9	0.5	66.1	1.0	0.6	Ind
	East of Pennsylvania	64.6	65.2	67.6	3.0	2.4	66.3	1.7	1.0	66.5	1.9	1.2	Ind
	West of Third	63.4	64.4	67.1	3.7	2.7	65.6	2.2	1.2	65.8	2.4	1.4	Ind
	East of Third	58.2	60.4	63.5	**5.2**	3.1	61.7	3.5	1.3	62.0	3.7	1.6	Ind
Arkansas Street	North of 18th	54.9	56.1	56.1	1.2	0.0	56.1	1.2	0.0	56.1	1.2	0.0	Res/Ind
	South of 18th	54.2	55.5	55.5	1.3	0.0	55.5	1.3	0.0	55.5	1.3	0.0	Res
Future Driveway	East of Illinois	NA	NA	65.2	NA	NA	60.6	NA	NA	61.6	NA	NA	Ind

Table 7.8 Continued

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline											Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative +Project (Max Res)	Change from Baseline	Change from Cumulative	With Cumulative + Code Compliant Alternative	Change from Baseline (2020)	Change from Cumulative Baseline (2040)	With Cumulative + 2010 Pier 70 Alternative	Change from Baseline (2020)	Change from Cumulative Baseline (2040)	
Illinois Street	North of Mariposa	56.8	60.4	62.0	**5.3**	1.6	61.1	4.4	0.7	61.3	4.5	0.9	Vacant/UCSF
	Mariposa-19th	59.9	60.4	63.7	**3.8**	**3.3**	62.1	2.2	1.8	62.4	2.5	2.0	Res/Com/Ind
	19th to 20th	60.4	60.6	64.6	**4.1**	**4.0**	62.6	2.2	2.0	62.9	2.5	2.3	Res/Com/Ind
	20th to Driveway	58.9	59.5	64.8	**5.9**	**5.3**	61.9	3.0	2.4	62.2	3.3	2.7	Ind
	Driveway to 22nd	58.9	60.9	66.4	**7.5**	**5.5**	63.5	4.6	2.6	63.9	5.0	3.0	Ind
	South of 22nd	57.6	59.6	63.9	**6.3**	4.3	61.7	4.1	2.1	62.2	4.6	2.6	Ind
Indiana Street	North of 22nd	54.1	55.3	55.3	1.1	0.0	55.3	1.1	0.0	55.3	1.1	0.0	Com/Ind
	South of 22nd	54.6	55.2	55.2	0.6	0.0	55.2	0.6	0.0	55.2	0.6	0.0	Ind
	North of 25th	58.6	61.5	62.5	**3.8**	0.9	62.0	**3.3**	0.5	62.1	**3.5**	0.6	Ind/Res
	South of 25th	57.5	60.0	60.0	2.6	0.0	60.0	2.6	0.0	60.0	2.6	0.0	Ind/Res
Mariposa Street	West of I-280 Ramp	63.8	64.3	64.3	0.5	0.1	64.3	0.5	0.0	64.3	0.5	0.0	Ind/Res
	East of I-280 Ramp	65.6	67.2	67.5	1.9	0.2	67.4	1.9	0.2	67.5	1.9	0.2	Ind
	East of Indiana	63.4	65.5	66.0	2.6	0.4	65.8	2.4	0.2	65.8	2.4	0.3	Ind
	West of Third	62.5	64.8	65.3	2.8	0.5	65.1	2.6	0.3	65.1	2.6	0.3	Ind/Res
	East of Third	60.3	63.1	63.8	3.5	0.7	63.3	3.0	0.2	63.4	3.1	0.3	Ind
	West of Illinois	60.2	63.1	63.8	3.6	0.7	63.3	3.1	0.2	63.4	3.2	0.3	Ind
	East of Illinois	59.6	61.5	61.5	1.9	0.0	61.5	1.9	0.0	61.5	1.9	0.0	Ind
Tennessee Street	North of 22nd	53.4	56.0	56.0	2.7	0.0	56.0	2.7	0.0	56.0	2.7	0.0	Com/Res
	South of 22nd	49.7	49.9	49.9	0.2	0.0	49.9	0.2	0.0	49.9	0.2	0.0	Res/Com
Texas Street	North of 18th	52.6	53.1	53.1	0.5	0.0	53.1	0.5	0.0	53.1	0.5	0.0	Res
	South of 18th	51.5	52.9	52.9	1.4	0.0	52.9	1.4	0.0	52.9	1.4	0.0	Res

Notes:

For comparison purposes, only the Proposed Project's Maximum Residential Scenario is presented in this table because the same roadway segments would be significantly affected by both scenarios; the slight variations in the incremental changes on the affected segments under each scenario are presented in Table 4.F.13: Summary of Cumulative Traffic Noise Levels, in Section 4.F, Noise and Vibration, pp. 4.F.77-4.F.81.

Noise levels may vary by up to one-tenth of a decibel due to rounding. Noise levels in **bold** exceed either of the following threshold increases when compared to baseline noise levels: (1) an increase of 5 dBA or more, or (2) an increase of 3 dBA or more in areas where the existing or resulting noise increase exceeds acceptable (or satisfactory) levels for the affected noise sensitive (e.g., residential) use (see Figure 4.F.3, San Francisco Land Use Compatibility Chart for Community Noise, p. 4.F.23).

L_{dn}/CNEL: CNEL and L_{dn} are 24-hour noise descriptors that add a 10-dBA penalty to all nighttime noise levels between 10:00 p.m. and 7:00 a.m. However, L_{dn} does not add the evening 5-dBA penalty between 7:00 p.m. and 10:00 p.m. In practice, L_{dn} and CNEL usually differ by less than 1 dBA at any given location from transportation noise sources.

dBA: A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies.

Source: Orion Environmental Associates, 2016

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When compared to 2020 baseline noise levels, this alternative would substantially reduce the number of roadway segments subject to significant noise increases (decreasing from 20 roadway segments with noise increases exceeding the 3-dBA/5-dBA thresholds to five roadway segments). With implementation of Mitigation Measure M-AQ-1f: Transportation Demand Management, these increases could be reduced by up to 1.0 dB, and all but one of these significant cumulative noise increases would be reduced to less than significant. Although there would still be a significant and unavoidable cumulative impact under this alternative for one roadway segment (20th Street east of Illinois Street) after implementation of this mitigation measure, the degree of impact would be less than the Proposed Project. This alternative's contribution to this cumulative impact would still be cumulatively considerable on this one roadway segment, but substantially less than the Proposed Project and slightly less than the 2010 Pier 70 Master Plan Alternative. It is noted that although the incremental noise increase on this roadway segment is considered to be significant (exceeding the 5-dBA threshold), future residences located adjacent to this segment would not be adversely affected by future noise levels because noise attenuation measures would be incorporated into these units as necessary to ensure that interior noise levels are maintained at acceptable levels even with future traffic noise level increases (see Mitigation Measure M-NO-6: Design of Future Noise-Sensitive Uses).

AIR QUALITY

Impacts During Construction

Like the Proposed Project, air quality impacts during construction of the Code Compliant Alternative would be significant and unavoidable with mitigation. This alternative would also have five phases of construction whereby buildings constructed during the earlier phases would be occupied during construction of the later phases. As described in Chapter 4, Section 4.G, Air Quality, estimated construction-related emissions of ROG and NOx for the Proposed Project would exceed the applicable significance thresholds during construction of phases 3, 4 and 5 with operational emissions from the previously constructed phases 1 and 2. Even with implementation of Mitigation Measures M-AQ-1a (Construction Emissions Minimization) through M-AQ-1h, emissions would exceed the significance thresholds with ROG levels at 152 pounds per day, NOx levels at 89 pounds per day, and PM_{10} levels at 75 pounds per day during construction of phase 5 under the Maximum Commercial Scenario and operation of the previous phases of the proposed project. Under the Code Compliant Alternative, NOx and PM_{10} would be reduced to below their respective significance thresholds during construction of Phases 4 and 5 and operation of the previous phases, but emissions of ROG would remain significant and unavoidable. As shown in Table 7.9: Mitigated Average Daily Emissions for the Code Compliant Alternative, the sum of construction-related and concurrent operational ROG emissions for the Code Compliant Alternative would be 66 pounds per day with implementation of Mitigation Measure M-AQ-1a

Table 7.9: Mitigated Average Daily Emissions for the Code Compliant Alternative

	Average Daily Emissions (lb/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Phase 1 and 2 Construction	**11**	**10**	**0.20**	**0.20**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 2 Construction (Post Phase 1)	10	6.6	0.18	0.18
Phase 1 Operation	21	16	9.9	3.1
Phase 2 Total	**31**	**23**	**10**	**3.3**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 3 Construction	8.3	5.4	0.12	0.11
Phase 1 and 2 Operation	39	26	18	5.7
Phase 3 Total	**47**	**31**	**18**	**5.8**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
Phase 4 Construction	9.4	5.7	0.15	0.15
Phase 1, 2 and 3 Operation	50	28	23	7.3
Phase 4 Total	**59**	**34**	**23**	**7.4**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	No	No	No
Phase 5 Construction	**2.5**	**4.6**	**0.13**	**0.13**
Phase 1, 2, 3 and 4 Operation	63	32	28	8.8
Phase 5 Total	**66**	**37**	**28**	**8.9**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	No	No	No

Notes:

lb = pounds

ROG = Reactive Organic Gases

NOx =Nitrogen Oxides

PM10 = Particulate matter <10 microns in diameter

PM2.5 = Fine particulate matter <2.5 microns in diameter

[a] The total emissions may not sum precisely due to rounding of subtotals.

Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold then the exceedance is identified by a bolded "Yes" response.

Source: ESA. 2016

through M-AQ-1g. Thus, similar to the Proposed Project, an offset emissions mitigation measure would be required to reduce ground-level ozone precursors exceeding the significance thresholds. Consequently, criteria pollutant emissions during construction of the Code Compliant Alternative would be significant and unavoidable with mitigation.

Operational Impacts

Like the Proposed Project, operational air quality impacts of the Code Compliant Alternative at build out would be significant and unavoidable even with mitigation. As described in Section 4.G, Air Quality, estimated operational emissions of ROG, NOx and PM_{10} under the Proposed Project would be 154, 84 and 77 pounds per day, respectively under the Maximum Residential Scenario and, 157, 87 and 84 pounds per day, respectively under the Maximum Commercial Scenario exceeding significance thresholds.

The Code Compliant Alternative would result in substantially lower vehicle trip generation compared to the Proposed Project Scenarios and, consequently, would have lower operational emissions. The Maximum Residential Scenario and the Maximum Commercial Scenario of the Proposed Project would generate 31,016 and 34,790 vehicle trips per weekday, respectively while the Code Compliant Alternative would generate only 12,690 vehicle trips per weekday[2]. As shown in Table 7.10: Average Daily and Maximum Annual Operational Emissions for the Code Compliant Alternative at Buildout (2030) with Mitigation, under the Code Compliant Alternative, NOx and PM_{10} would be reduced to below their respective significance thresholds during operation after full buildout of the Alternative, but emissions of ROG would remain significant and unavoidable. The same mitigation measures identified for the Proposed Project would apply to the Code Compliant Alternative, although the amount of emissions offset required would be 1.6 tons/year of ROG only as opposed to 25 tons/year of ozone precursors and 1 ton of PM_{10} required by the project under Mitigation Measure M-AQ-1h. Implementation of the emissions reduction project pursuant to Mitigation Measure M-AQ-1h could be conducted by the BAAQMD and would be outside the jurisdiction and control of the City and not fully within the control of the project sponsor. Mitigation Measure M-AQ-1h also allows the project sponsor to directly fund or implement an offset project; however no such project has yet been identified. Therefore, the residual impact of the Code Compliant Alternative emissions at full build out is conservatively considered significant and unavoidable with mitigation.

[2] Adavant, Consulting, Pier 70 Special Use District – Alternatives, Technical Trip Generation Tables, received via e-mail, from A. Kosinski of Fehr and Peers on June 1, 2016.

Table 7.10: Average Daily and Maximum Annual Operational Emissions for the Code Compliant Alternative at Buildout (2030) with Mitigation

	Average Daily Emissions (pounds/day)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile	28	22	28	8.2
Energy	0.97	8.7	0.67	0.67
Area Sources	35	0.28	0.14	0.14
Total[a]	**64**	**30**	**29**	**9.0**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	No	No	No
	Maximum Annual Emissions (short tons/year)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile	5.1	3.9	5.1	1.5
Energy	0.18	1.6	0.12	0.12
Area Sources	6.3	0.05	0.03	0.03
Total[a]	**11.6**	**5.5**	**9.5**	**1.7**
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	No	No	No
Estimated Emissions Reduction Required by Offsets	1.6	0	0	0

Notes:

lb = pounds

ROG = Reactive Organic Gases

NOx =Nitrogen Oxides

PM10 = Particulate matter <10 microns in diameter

PM2.5 = Fine particulate matter <2.5 microns in diameter

[a] The total emissions may not sum precisely due to rounding of subtotals.

Bolded numerical values are totals during construction of a given phase with the addition of operational emissions from previous phases. If the total exceeds a threshold then the exceedance is identified by a bolded "Yes" response.

Mitigated mobile emissions include a 20 percent reduction from implementation of TDM program.

Source: ESA, 2016

Toxic Air Contaminants

Similar to the Proposed Project, construction and operation of the Code Compliant Alternative would generate toxic air contaminants, including diesel particulate matter. However, under this alternative, building heights would be reduced and backup diesel generators would not be required for any buildings, resulting in fewer emissions of diesel particulate matter (DPM). As

discussed above, the Code Compliant Alternative would generate fewer vehicle trips than the Proposed Project. Additionally the Code Compliant Alternative would result in reduced square footage of development and reduced construction emissions of exhaust-emitted $PM_{2.5}$.

Construction-related $PM_{2.5}$ emissions are estimated to be 5 percent and 6 percent less than the Maximum Residential Scenario and the Maximum Commercial Scenario, respectively. Like the Proposed Project (see Table 4.G.14: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Maximum Residential Scenario at Off-Site Receptors, and Table 4.G.15: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Maximum Commercial Scenario at Off-Site Receptors, in Section 4.G, Air Quality, p. 4.G.66 and p. 4.G.67, respectively), resultant $PM_{2.5}$ concentrations at off-site receptor locations would be below significance thresholds for construction and operation of the Code Compliant Alternative. Similarly, like the Proposed Project (see Table 4.G.16: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions at the Maximally Impacted On-Site Receptors, p. 4.G.68), resultant $PM_{2.5}$ concentrations at on-site receptor locations would be below significance thresholds for construction and operation. Therefore, the Code Compliant Alternative would not result in sensitive receptor locations meeting the Air Pollutant Exposure Zone (APEZ) criteria for $PM_{2.5}$, and impacts related to construction and operational $PM_{2.5}$ concentrations would be less than significant.

The Code Compliant Alternative would result in less square footage of development and reduced construction emissions of exhaust-emitted DPM. Construction-related DPM emissions are estimated to be 5 and 6 percent less than the Maximum Residential Scenario and the Maximum Commercial Scenario, respectively. The lifetime cancer risk at on-site receptors under the Code Compliant Alternative would be less than significant with mitigation, like for the Proposed Project, and the Mitigation Measure M-AQ-1a: Construction Emissions Minimization, would apply to this alternative. For the Proposed Project (see Table 4.G.16), the unmitigated risk would exceed the significance threshold but implementation of Mitigation Measure M-AQ-1a would reduce the risk to less than significant. Mitigation Measure M-AQ-1b: Diesel Backup Generator Specifications would not be required under this alternative because building heights would be reduced to the extent that backup diesel generators would not be required for any buildings.

For the Code Compliant Alternative, implementation of Mitigation Measure M-AQ-1a would further ensure that increased cancer risk at the maximally impacted on-site receptors would be below the threshold of 100 in one million. As with the Proposed Project, no off-site receptor location under the Code Compliant Alternative would experience cumulative excess cancer risk exceeding 100 per one million persons exposed with or without implementation of Mitigation Measure M-AQ-1. Therefore, the Code Compliant Alternative would not result in sensitive receptor locations meeting the APEZ criteria for excess cancer risk, and construction and operational cancer risk would be less than significant with mitigation.

Consistency with Clean Air Plan

Like the Proposed Project, impacts related to consistency with the 2010 Clean Air Plan (CAP) for the Code Compliant Alternative would be less than significant with mitigation. Under the Code Compliant Alternative there would be fewer vehicle trips and building heights would be reduced such that backup diesel generators would not be required for any buildings, resulting in fewer emissions.

The Code Compliant Alternative would align with the applicable recommended measures of the 2010 CAP in the same manner as presented for the Proposed Project in Table 4.G.17: Control Strategies of the 2010 Clean Air Plan, pp. 4.G.71-4.G.74. Like the Proposed Project, it would require implementation of the same TDM Program (see Chapter 2, Project Description, p. 2.51), Mitigation Measure M-TR-4 to improve local bus service if SFMTA acknowledges it is warranted, and Mitigation Measure M-AQ-1f, which requires implementation of additional TDM measures. The additional inclusion of bike lanes and unbundled parking would ensure consistency with applicable Transportation Control Measures contained in the 2010 CAP. Applicable Mobile Source Control measures of the 2010 CAP would be implemented via Mitigation Measure M-AQ-1g and Mitigation Measure M-AQ-1h. Energy and Climate Measures of the 2010 CAP would be addressed through compliance with the City's Green Building Requirements for energy efficiency and renewable energy as well as the inclusion of open space into the Code Compliant Alternative. The Code Compliant Alternative would also not hinder implementation of the 2010 CAP. Therefore, the Code Compliant Alternative would not conflict with, or obstruct implementation of the 2010 CAP, and this impact would be less than significant with mitigation.

Odors

Although there may be some potential for small-scale, localized odor issues to emerge around development uses under the Code Compliant Alternative such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site and off-site sensitive receptors would be unlikely. BAAQMD Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds and applies to restaurants that employ more than five persons. Therefore, like the Proposed Project, the Code Compliant Alternative would not create objectionable odors that would affect a substantial number of people.

Cumulative Air Quality Impacts

Like the Proposed Project, the cumulative air quality impacts of the Code Compliant Alternative would be significant and unavoidable with mitigation. Because the Proposed Project would result

in both construction and operational emissions of ROG, NOx and PM_{10} exceeding their respective significance thresholds, the Proposed Project's contribution to cumulative air quality impacts is considered significant and unavoidable, even with mitigation. Similarly, the Code Compliant Alternative would result in significant and unavoidable air quality impacts from emissions of ROG after implementation of mitigation measures, and consequently, would result in a cumulatively considerable contribution to regional and local air quality impacts. Therefore, this impact would be significant and unavoidable with mitigation.

Although the Code Compliant Alternative would result in fewer vehicle trips and building heights would be reduced such that backup diesel generators would not be required for any buildings, the Code Compliant Alternative would result in a similar cumulative health risk impact as the Proposed Project, which was determined to be less than significant with implementation of Mitigation Measure M-AQ-1a: Construction Emissions Minimization, primarily as the result of construction-related emissions of DPM. As discussed for the proposed project, 2040 cumulative heath risk modeling is based on growth projections that would have reasonably accounted for the traffic emissions from the reasonably foreseeable projects listed in Section 4.A, Introduction to Chapter 4, pp. 4.A.9-4.A.18. That modeling shows future background risks are projected to be reduced in 2040 compared to existing conditions as a result of improved vehicle fleets and the electrification of Caltrain. Therefore, by adding the project's health risks on top of 2040 health risk conditions, the Code Compliant Alternative with mitigation would not result in new locations meeting the APEZ criteria that otherwise would not.

GREENHOUSE GAS EMISSIONS

A variety of controls are in place to ensure that development in San Francisco would not impair the State's ability to meet Statewide GHG reduction targets outlined in AB 32, nor impact the City's ability to meet San Francisco's local GHG reduction targets. Projects that are consistent with San Francisco's GHG reduction strategy would not contribute significantly to global climate change. Similar to the Proposed Project, the Code Compliant Alternative would be required to comply with these regulations and requirements that reduce GHG emissions and would be consistent with San Francisco's GHG reduction strategy. As with the Proposed Project, this alternative would introduce a mixed-use development in an area that is served by public transit, and would include Class I and Class II bicycle parking spaces, energy efficiency features beyond Title 24 requirements, low-impact stormwater management design, water-efficient landscaping, water-conserving interior design, convenient recycling and composting, street trees, and other features consistent with San Francisco's ordinances and requirements. Similar to the proposed project, development would be consistent with the Sustainable Communities Strategy by including residential and commercial uses in a designated Priority Development Area per Plan Bay Area, furthering the region's goals for reducing GHG emissions. Therefore, as with the

Proposed Project, the Code Compliant Alternative would have a less than cumulatively considerable contribution to significant cumulative GHG impacts.

WIND AND SHADOW

Under the Code Compliant Alternative, most of the buildings would be 40 feet tall, except parcels HDY, PKN, and PKS located at the western end of the development on Illinois Street, which would be 65 feet in height (see Figure 7.1 on p. 7.17). At 65 feet, the western parcels are the same height as those of the Proposed Project. However, other buildings in this alternative are significantly shorter in height when compared to the Proposed Project, where buildings range in height from 50 to 90 feet, with the tallest buildings being in the interior of the layout. The layout of the parcels in the plan for this alternative would be similar to that of the Proposed Project but with less open space (5.76 acres, versus 9 acres under the Proposed Project) and more area dedicated to surface parking lots.

Wind

Under the Code Compliant Alternative, wind speeds in the interior of the project site would be reduced compared to the existing conditions.[3] Under this alternative, the taller buildings at the western end of the project site would buffer winds and provide wind protection for the interior of the project site and the shorter buildings to the east. However, the taller buildings would result in increased wind speeds, compared to existing conditions, on Illinois and 20th streets that form the upwind boundaries of the site. It is expected that under this alternative, winds at all locations within the project site would not exceed the Planning Code's hazard criterion. Under the Proposed Project, winds were predicted to exceed the hazard criterion at one off-site location to the north of the project site. It is likely that, under this alternative, winds at that location could potentially continue to exceed the hazard criterion.

Wind speeds that exceed the 11 miles per hour (mph) comfort criterion occur under existing conditions at the majority of locations tested. However, as with the Proposed Project, the buildings under this alternative would reduce the exposure of the site to the prevailing westerly winds and thereby reduce wind speeds in the interior streets and open spaces between buildings. Therefore, winds at a majority of the areas in the interior of the site are expected to comply with the 11 mph comfort criterion under the Code Compliant Alternative. In addition, wind speeds under this alternative would be similar to or lower than those under the Proposed Project due to the similar layout of the building footprints and the lower building heights.

[3] Neetha Vasan and Frank Kriksic, RWDI, Consulting Engineers and Scientists, *Memorandum: Pedestrian Wind Analysis – Review of DEIR Alternatives, Pier 70 Mixed-Use District Project*, June 17, 2016.

Under the Proposed Project plus cumulative development scenario, cumulative projects would not have a substantial influence on the wind conditions on and around the project site when compared to the baseline conditions. As under the Proposed Project, under the Code Compliant Alternative cumulative projects would be relatively low in height and separated from the project site by a few blocks. For these reasons, cumulative projects are not expected to cause any substantial difference in wind conditions on the project site under the Code Compliant Alternative.

Under the Code Compliant Alternative, wind speeds would be reduced overall when compared to those under the Proposed Project. Like the Proposed Project, which would have less-than-significant wind impacts as described in Section 4.I, Wind and Shadow, this alternative, with mitigation, would not alter wind in a manner that substantially affects public areas. As such, the Code Compliant Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to wind.

Shadow

Under this alternative, the new buildings within the project site would be shorter than those under the Proposed Project. As such, shadow under this alternative would not reach any existing public open spaces in the vicinity of the project site (including the future Crane Cove Park) at any time of year from one hour after sunrise to one hour before sunset. Under this alternative shadow impacts on existing streets within the vicinity of the project site would be less than those of the Proposed Project.

Like the Proposed Project, which would have less-than-significant shadow impacts as described in Section 4.I, Wind and Shadow, this alternative would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas. As such, the Code Compliant Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to shadow.

The discussion of shadow from new buildings on public open spaces that would be constructed within the project site under the Code Compliant Alternative is provided for informational purposes.

With the exception of the Illinois Street parcels at the westernmost portion of the project site, building heights under this alternative would be limited to 40 feet within the 28-Acre Site. Thus, at any given time, shadows from such buildings would be commensurately and proportionally shorter than the 90- and 70-foot-tall buildings proposed for the 28-Acre Site under the Proposed Project. However, the shorter shadows under this alternative would be offset by the overall smaller area of public open space under this alternative, such that reduced shadow under this

alternative would occupy a comparatively greater proportion of the reduced amount of open space created under this alternative.

Shadow from buildings within the project site under the Code Compliant Alternative would behave in a similar fashion as under the Proposed Project. Shadows would be longest at sunrise and sunset when the sun is lowest in the sky and shortest at midday when the sun is highest in the sky. At sunrise, when the sun is in the eastern sky, shadows would reach westward. As the morning progresses, shadows would sweep eastward while growing shorter. At midday, shadows would reach northward and would be at their shortest. From midday, shadows would continue to sweep eastward while growing longer through the afternoon and into the early evening until sunset. Thus, shadow is ephemeral and generally moves across properties from west to east in a clockwise sweep radiating from the project site.

The shadow on the waterfront parks under this alternative would be qualitatively similar to that described for the Waterfront Terrace and Waterfront Promenade open spaces under the Proposed Project in Section 4.I, Wind and Shadow. Shadow under this alternative would be somewhat reduced from those of the Proposed Project in the early afternoon due to the lower height of buildings along the waterfront south of 21st Street. However, this reduction in shadow would be offset by the absence of the Slipways Commons open space. Under the Proposed Project, Slipways Commons creates a sunny gap between shadows cast on the Waterfront Terrace and Waterfront Promenade open spaces by waterfront buildings during afternoons for most of the year.

As with the Proposed Project, shadow from the Code Compliant Alternative would not substantially affect the use of the proposed network of open spaces included as part of this alternative. As new public open spaces would be created under this alternative, shadow from new buildings under this alternative would not interfere with any existing recreational uses within the project site or any existing recreation-based expectations for sunlight on these spaces. During peak hours of use throughout most of the year, the open spaces created under this alternative would be mostly or substantially in sun and are assumed to provide ample seating opportunities in sunny locations for users who prefer sun, as well as shady locations for those who prefer shade.

RECREATION

The Code Compliant Alternative would reduce the amount of open space provided on the project site from about 9 acres under the Proposed Project, to 5.76 acres of open space under this alternative (by 36 percent). However, as discussed above under Population and Housing for this alternative, the residential population within the project site would be considerably reduced compared to the Proposed Project under either scenario due to the reduction in number of residential units under this alternative (590 units) compared to the Proposed Project under the

Maximum Residential Scenario (3,025 units) or the Maximum Commercial Scenario (1645 units).

Like the Proposed Project, which would have less-than-significant recreation impacts as described in Section 4.J, Recreation, this alternative would not increase the use of recreational facilities such that physical deterioration of the facilities would be accelerated, would not require construction of new or expanded recreational facilities, and would not physically degrade existing recreational resources. As such, the Code Compliant Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to recreation.

UTILITIES AND SERVICE SYSTEMS

The Code Compliant Alternative would include approximately 45 percent less square footage of development than the Proposed Project. The potable water or wastewater demands under this alternative would increase relative to existing conditions, but would be less than that evaluated under the Proposed Project. However, similar to the Proposed Project, new water and wastewater infrastructure would be constructed at the project site to accommodate the increased flows, including the new components of the combined sewer system and the 20th Street Pump Station that would be constructed under the Proposed Project. Similar to the Proposed Project, development under the Code Compliant Alternative would trigger the requirements of the City's Stormwater Management Requirements and Design Guidelines, and stormwater flows to the combined sewer system would be reduced by up to 25 percent. Because the wastewater flows would be less than under the Proposed Project, the flows would remain within the capacity of the SEWPCP.

Like the Proposed Project, which would have less-than-significant impacts with mitigation on utilities and service systems as described in Section 4.K, Utilities and Service Systems, the Code Compliant Alternative, with mitigation, would not exceed applicable wastewater treatment requirements, require construction or expansion of water, wastewater or stormwater facilities, would not require new or expanded water supply resources or entitlements, would not result in a determination that that project has inadequate wastewater treatment capacity, would be served by a landfill with sufficient capacity, and would comply with Federal, State and local statutes and regulations related to solid waste. As such, the Code Compliant Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to utilities and service systems.

PUBLIC SERVICES

As discussed above under Population and Housing for the Code Compliant Alternative, the residential and employee population within the project site would be considerably reduced under this alternative, as compared to that of the Proposed Project. This alternative would not adversely affect the ability for the site to be adequately served by existing police protection, fire protection and emergency medical services, public school facilities, and public libraries.

Like the Proposed Project which would have less-than-significant public services impacts as described in Section 4.L, Public Services, this alternative would not result in adverse physical impacts associated with the provision of, or need for new or physically altered facilities the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire and emergency medical protection, police protection, schools, libraries, or other services. As such, the Code Compliant Alternative would not have any significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to public services.

BIOLOGICAL RESOURCES

Compared with the Proposed Project, the Code Compliant Alternative would have less potential for impacts on biological resources due to less soils disturbance under the reduced grading program for this alternative and a reduced overall construction program. However, potential impacts on biological resources would be substantially similar in character to the terrestrial and marine biological impacts analyzed for the Proposed Project with respect to ground disturbance, land conversion, geotechnical stabilization, and infrastructure development.

This alternative includes construction of an engineered berm along the eastern property boundary and riprap along the water's edge to address projected sea level rise flooding risks. Similar to the Proposed Project, the Code Compliant Alternative would require a certification and/or waste discharge requirements from the Regional Water Quality Control Board (RWQCB) and a permit from San Francisco Bay Conservation and Development Commission (BCDC) for development within the shoreline band of the Bay.

Like the Proposed Project, which would have less-than-significant biological resources impacts with mitigation, as described in Section 4.M, Biological Resources, this alternative, with mitigation, would not have a substantial adverse effect on a candidate, sensitive or special status species, riparian habitat, sensitive natural community, or on Federally protected wetlands; would not interfere with the movement of any migratory fish or wildlife species; would not conflict with any local policies or ordinances protecting biological resources; and would not conflict with an

adopted habitat conservation plan, natural community conservation plan or other approved habitat conservation plan. As such, the Code Compliant Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to biological resources.

GEOLOGY AND SOILS

While the gross square footage of development under the Code Compliant Alternative is approximately 45 percent less than under the Proposed Project, the development footprint is about the same. Similar to the Proposed Project, new development under this alternative would be required to comply with the City of San Francisco and Port of San Francisco Building Code to reduce seismic hazards. As for the Proposed Project, existing Buildings 2, 12, and 21 would be improved to meet seismic safety building code requirements. Because the extent of soil disturbance would be approximately the same as the Proposed Project and this alternative includes the same street network improvements, the potential for soil erosion, change in site topography, creation of unstable slopes, and disturbance of paleontological resources is similar to the Proposed Project. This alternative would result in similar risks related to rockfall hazard that would be less than significant with implementation of Mitigation Measure M-GE-3a: Reduction of Rockfall Hazards, which requires the use of active controls or setbacks to reduce risks associated with rock falls. This alternative would result in similar risks related to use of the dilapidated pier, assuming implementation of Mitigation Measure M-GE-3b: Signage and Restricted Access to Piers, to restrict access to the existing dilapidated pier.

Like the Proposed Project which would have less-than-significant geology and soils impacts with mitigation as described in Section 4.N, Geology and Soils, this alternative, with mitigation, would not expose people or structures to seismic risks, would not result in substantial soil erosion or the loss of topsoil, would not be located on geologic unit or soil that is unstable, and would not substantially change the topography or any unique geologic or physical features of the site, including paleontological resources. As such, the Code Compliant Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to geology and soils.

HYDROLOGY AND WATER QUALITY

The Code Compliant Alternative would include approximately 45 percent less square footage of development than the Proposed Project. The wastewater demands under this alternative would increase relative to existing conditions, but would be less than under the Proposed Project. The volume of stormwater discharged to the City's combined sewer system would be approximately the same as would occur under wastewater and stormwater Option 1 of the Proposed Project because the development footprint would be approximately the same as the Proposed Project and

development under this alternative would trigger the applicability of the Stormwater Management Requirements and Design Guidelines, which require up to a 25 percent reduction in stormwater flows. Similar to the Proposed Project, this alternative would include construction of new wastewater and stormwater infrastructure, including a new 20th Street Pump Station. The change in wastewater and stormwater flows could potentially cause the frequency of CSDs from the 20th Street sub-basin and/or downstream basins to increase beyond the long-term average of 10 CSD events per year, in violation of the Bayside National Pollutant Discharge Elimination System (NPDES) permit. However, assuming implementation of Mitigation Measure M-HY-2a: Design and Construction of Proposed Pump Station for Options 1 and 3, which specifies performance standards for the pump station, this impact would be less than significant with mitigation as for the Proposed Project.

Because the Code Compliant Alternative development footprint would be similar to the Proposed Project and the amount of impervious surfaces created would be similar, water quality impacts related to the potential for soil erosion, groundwater dewatering, alteration of drainage patterns, and groundwater depletion and interference with groundwater recharge would be similar to the less-than-significant impacts of the Proposed Project. Similar to the Proposed Project, this alternative would include construction of shoreline improvements and repairs to the CSD outfalls as would occur under all Proposed Project stormwater options, which could result in water quality effects related to in-bay construction, but these impacts would remain less than significant through the implementation of regulatory requirements. Because this alternative would use the City's combined sewer system, the in-bay construction would be the same as would be required for Option 1. However, this alternative would not require the construction of a new stormwater outfall as would be constructed under wastewater and stormwater management Options 2 and 3 of the Proposed Project, therefore there would be less in-bay construction under this alternative as compared to wastewater and stormwater management Options 2 and 3. Because development would be less under this alternative, there would be less of a potential for littering, and water quality impacts related to littering would be less than for the Proposed Project.

This alternative includes construction of a four-foot-high berm along the waterfront portion of the project site that would raise the grade along the waterfront to an elevation of about 15.4 feet NAVD88 (104 feet project datum), which is approximately the same elevation as the projected 100-year flood elevation with 66 inches of sea level rise. This berm would have a slope of 3:1 and would not substantially alter the patterns of flood flows at the project site or in the vicinity, and would protect the interior of the project site from future flooding as a result of sea level rise and from flooding due to a tsunami. Further, the stormwater drainage system that would be installed as part of this alternative would be sized to adequately convey stormwater flows in accordance with San Francisco's subdivision regulations and this alternative would not exacerbate future flooding conditions.

Like the Proposed Project, which would have less-than-significant hydrology and water quality impacts with mitigation as described in Section 4.O, Hydrology and Water Quality, this alternative, with mitigation, would not violate any water quality standards or waste discharge requirements, would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge, would not substantially alter the existing drainage pattern of the site or area, would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, would not place within a 100-year flood hazard area housing or structures that would impede or redirect flood flows, and would not expose people or structures to a significant risks involving flooding, inundation by seiche, tsunami, or mudflow. As such, the Code Compliant Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to hydrology and water quality.

HAZARDS AND HAZARDOUS MATERIALS

While the Code Compliant Alternative would include approximately 45 percent less square footage of development than the Proposed Project, the development footprint would be similar to the Proposed Project and the same buildings would be demolished and retained. Therefore, this alternative would have impacts similar to the Proposed Project related to the use of hazardous materials during construction, the potential to encounter hazardous building materials, the potential to encounter PCBs as a result of transformer removal, the potential to encounter hazardous materials in the soil and groundwater during construction, the potential to damage existing groundwater monitoring wells, the potential to interfere with remediation of the PG&E Responsibility Area, and the emissions of DPM and dust containing naturally-occurring asbestos or metals within ¼ mile of a school. With implementation of Mitigation Measures M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers, M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed, M-HZ-2c: Conduct Soil Sampling if Stained Soil is Observed, M-HZ- 3a: Implement Construction-Related Measures of the Pier 70 RMP, M-HZ-3b: Implement Well Protection Requirements of the Pier 70 RMP, M-HZ-4: Implement Construction-Related Measures of the Hoedown Yard Site Management Plan, and M-HZ-5: Delay Development on Proposed Parcel H2 Until Remediation of the PG&E Responsibility Area is Complete, all of these impacts would be less than significant for the Code Compliant Alternative, as for the Proposed Project.

Similar to the Proposed Project, existing and future occupants of the project site would be protected from exposure to hazardous materials in the soil and groundwater as well as naturally-occurring asbestos and metals through implementation of Mitigation Measures M-HZ-6: Additional Risk Evaluations and Vapor Control Measures for Residential Land Uses, M-HZ-7:

Modify Hoedown Yard Site Mitigation Plan, M-HZ-8a: Prevent Contact with Serpentinite Bedrock and Fill Materials in Irish Hill Playground, and M-HZ-8b: Restrictions on the use of Irish Hill Playground. There would be fewer new site uses under the Code Compliant Alternative; therefore, less hazardous materials would likely be used during operation and there would be less of a fire risk. The changes in the street network would be the same as the Proposed Project, and there would be less operational traffic; therefore, this alternative would have less of a potential impact on interference with emergency response.

Like the Proposed Project which would have less-than-significant hazards and hazardous materials impacts with mitigation as described in Section 4.P, Hazards and Hazardous Materials, this alternative, with mitigation, would not create a significant hazard through handling of hazardous materials, would not be located on a site which is included on a list of hazardous materials sites, would not be located within an airport land use plan or within two miles of a public airport or in the vicinity of a private airstrip, would not interfere with an adopted emergency response plan or emergency evacuation plan, and would not expose people or structures to a significant risk of loss, injury or death involving fires. As such, the Code Compliant Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to hazards and hazardous materials.

MINERAL AND ENERGY RESOURCES

There are no known mineral resources within the project site. Similar to the Proposed Project, the Code Compliant Alternative would have no impact on a mineral resource and would not contribute to a significant cumulative impact on a mineral resource.

The potential impacts related to minerals and energy resources under the Code Compliant Alternative would be similar to, but slightly less than, those of the Proposed Project. Like the Proposed Project which would have less-than-significant energy resources impacts as described in Section 4.Q, Mineral and Energy Resources, this alternative would not involve the use of wasteful or large amounts of fuel, water or energy. As such, the Code Compliant Alternative would not have any significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to mineral and energy resources.

AGRICULTURAL AND FOREST RESOURCES

Similar to the Proposed Project, the Code Compliant Alternative would not convert farmland, conflict with agricultural or forest land zoning or a Williamson Act contract, nor result in a loss or conversion of forest land or farmland. The potential impacts related to agricultural and forest resources under the Code Compliant Alternative would be the same as those for the Proposed

Project. Therefore, as with the Proposed Project, there would be no impacts related to agricultural and forest resources under the Code Compliant Alternative.

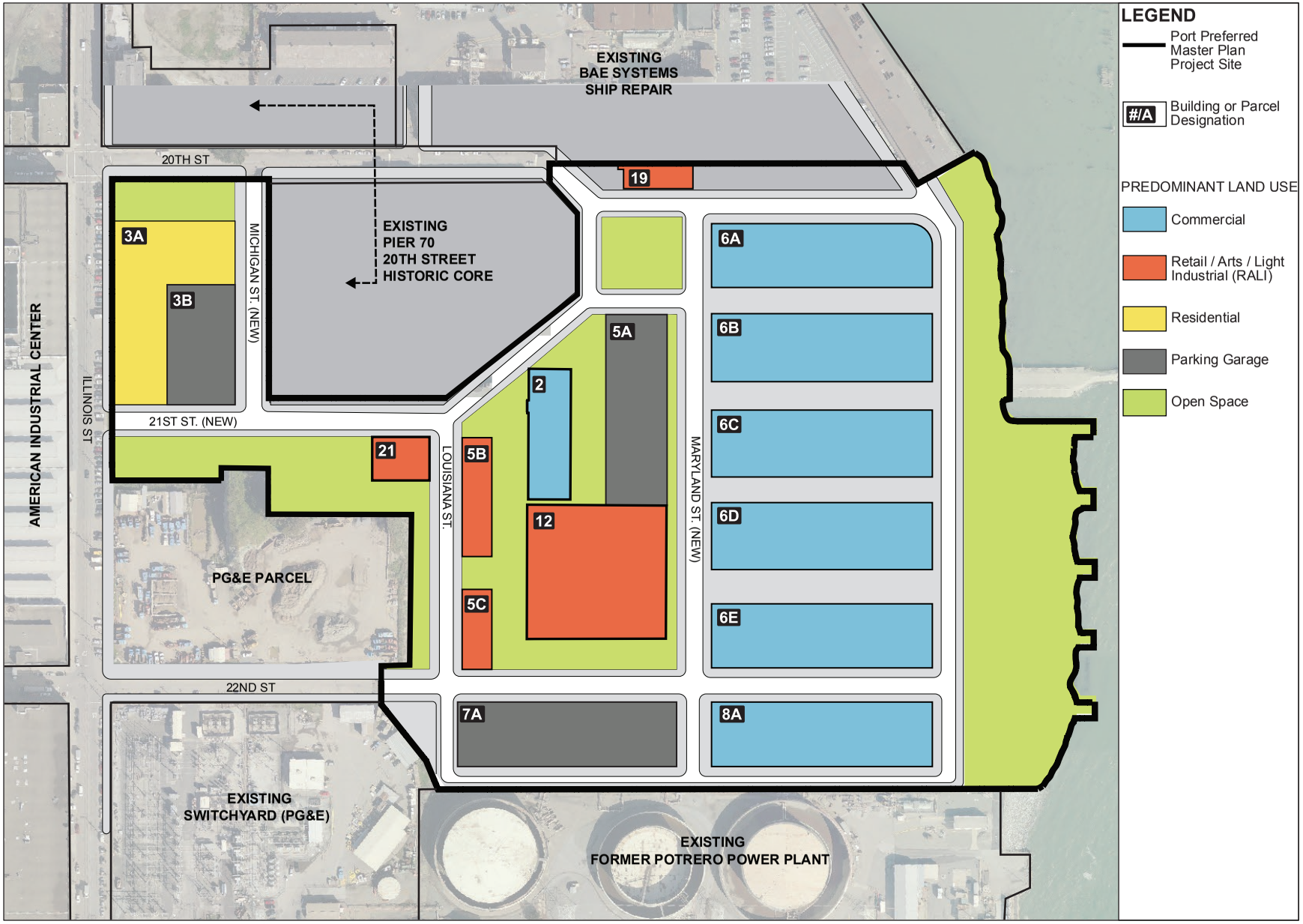
D. 2010 PIER 70 MASTER PLAN ALTERNATIVE

Description

The 2010 Pier 70 Master Plan Alternative would conform with the Port of San Francisco's 2010 Pier 70 Preferred Master Plan. (See "Port of San Francisco Pier 70 Preferred Master Plan" in Chapter 3, Plans and Policies, on pp. 3.7-3.9.) The 2010 Pier 70 Master Plan Alternative includes approximately 31.4 acres, and would not include development on the 3.6-acre Hoedown Yard; this parcel would continue to be owned and operated by PG&E as a storage and maintenance yard.

The 2010 Pier 70 Master Plan Alternative would include approximately 2,153,330 gsf of development, about 50 percent less square footage than under the Proposed Project. (See Figure 7.3: 2010 Pier 70 Master Plan Alternative – Land Use Plan.) This alternative would include 195 residential units totaling 160,440 gsf, 1,698,780 gsf of commercial (office) use, 188,610 gsf of retail use, and 105,500 gsf of RALI uses. The 2010 Pier 70 Master Plan Alternative would provide 405 on-street vehicle parking spaces and 2,120 off-street spaces located on several surface parking lots on the site. Under this alternative, 8.07 acres of open space would be constructed, including promenade and terrace areas along the waterfront, a plaza and market square around Buildings 2 and 12, an open space block along the northern portion of the 28-Acre Site, and a plaza on 20th Street north of Building 3A. Unlike the Proposed Project, this alternative does not include the Maximum Residential Scenario and the Maximum Commercial Scenario as optional development scenarios.

Like the Proposed Project, this alternative would include a Design for Development document comparable to that of the Proposed Project, but would apply specifically to the height districts, use program, and site plan for streets, configuration of parcels, and open spaces under this alternative. As with the Proposed Project, the Design for Development under this alternative would establish standards and guidelines for the rehabilitation of historic buildings, buildable zones for infill construction, and would contain project-wide as well as location-specific massing and architecture requirements that would govern the design of infill construction within the project site to ensure architectural compatibility with historic buildings within the UIW Historic District.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

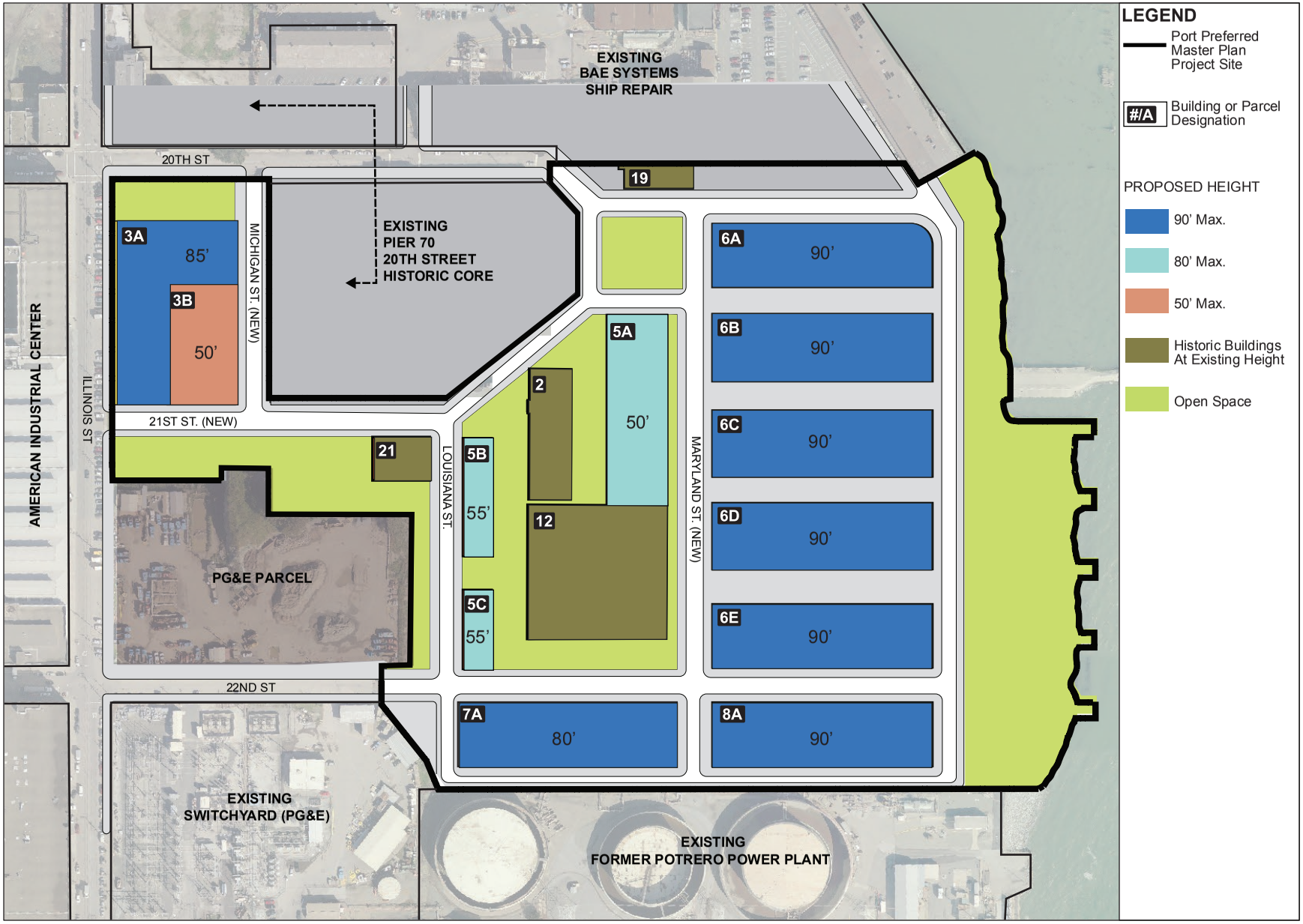
FIGURE 7.3: 2010 PIER 70 MASTER PLAN ALTERNATIVE - LAND USE PLAN

Under the 2010 Pier 70 Master Plan Alternative, a total of 293,228 gsf of existing buildings would be retained and rehabilitated in accordance with the *Secretary of the Interior's Standards*. Buildings 2, 12, and 19 on the project site would be retained and rehabilitated in their current location, and Building 21 would be relocated just to the south of the 20th Street Historic Core boundary,[4] at the intersection of Louisiana and 21st streets within the project site. The remaining six structures on the project site (Buildings 11, 15, 16, 25, 32, and 66), containing about 858,572 gsf, would be demolished. As with the proposed project, the northern spur of the Irish Hill remnant would be removed to allow for the construction of 21st Street.

Similar to the Proposed Project, this alternative would amend the *General Plan* and Planning Code, adding a new Pier 70 SUD, which would establish land use and zoning controls for the 31.4-acre site. The existing Zoning Map would be amended to show changes from the current Zoning District (M-2 and P) to the proposed SUD zoning. Under this alternative, as under the Proposed Project, the existing Height and Bulk Districts of 65-X and 40-X would be increased to 90-X, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet, but would become public open space under this alternative. (See Figure 7.4: 2010 Pier 70 Master Plan Alternative – Maximum Height Plan.)

Similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative includes construction of transportation and circulation improvements. Under this alternative, the following transportation and circulation improvements would be implemented: construction of a new 21st Street, reconstruction of 20th and 22nd streets, and construction of new Louisiana and Maryland streets. All new and reconstructed streets would be built with sidewalks. The 2010 Pier 70 Master Plan Alternative would include the same bicycle circulation improvements (Bay Trail extension, Class II and Class III facilities on internal streets, and a bikeshare location) as the Proposed Project. The 2010 Pier 70 Master Plan Alternative would include the same TDM program as the Proposed Project, with exception of those items that pertain only to residential tenants. The TDM program would include establishment of a TMA that employs an on-site transit coordinator, operation of a shuttle system, maintenance of a TMA website with real-time transit information, distribution of educational documents, coordination of ride-matching services, enrollment in Emergency Ride Home program, employment of a district parking strategy, unbundled residential and commercial parking, provision of car-share parking spaces, metering of on-street parking, and parking wayfinding signage across the site.

[4] The 20th Street Historic Core is an approximately 7-acre portion of the UIW Historic District located immediately north of the 28-Acre Site along 20th Street. It contains 270,000 gsf of largely vacant industrial and office space currently undergoing rehabilitation for adaptive reuse.



Source: Sitelab Urban Studio, Turnstone Consulting/SWCA (2015)

PIER 70 MIXED-USE DISTRICT PROJECT

FIGURE 7.4: 2010 PIER 70 MASTER PLAN ALTERNATIVE - MAXIMUM HEIGHTS PLAN

Under this alternative, new and upgraded utilities and infrastructure, and a new 20th Street Pump Station, would be constructed. A combined sewer and stormwater system would be built, similar to Option 1 under the Proposed Project, but with slightly different alignments due to different building and roadway siting and locations. Unlike the Proposed Project, this alternative does not include variants. The 2010 Pier 70 Master Plan Alternative would further some of the project sponsors' objectives, as shown in Table 7.16: Ability of Alternatives to Meet Project Objectives, pp. 7.92-7.95.

The 2010 Pier 70 Master Plan Alternative includes about 47,962 cubic yards of off-haul of excavated materials and about 8,900 cubic yards of clean fill import. It also includes construction of an engineered berm along the eastern property boundary with an approximately 3:1 slope and a maximum height of approximately four feet to address projected sea level rise flooding risks. Shoreline protection improvements under this alternative, including placement of new riprap along the water's edge, would be similar to those under the Proposed Project. Implementation of this alternative would take place over a period of 11 years, like the Proposed Project, and in up to four phases (as opposed to up to five for the proposed project).

Similar to the Proposed Project, an exchange of land under the Public Trust Exchange Agreement would occur under the 2010 Pier 70 Master Plan Alternative in order to clarify the Public Trust status portions of Pier 70, which would free some portions of the project site from the Public Trust while committing others to the Public Trust.

Impacts of the 2010 Pier 70 Master Plan Alternative

LAND USE AND LAND USE PLANNING

Under the 2010 Pier 70 Master Plan Alternative, the number of residential units would be considerably reduced to 195 units (93.6 percent fewer units than under Maximum Residential Scenario, and 88.1 percent fewer units than under the Maximum Commercial Scenario). The amount of commercial development under the 2010 Pier 70 Master Plan (in gsf) would be increased to 1,698,780, considerably more than that of the Proposed Project under the Maximum Residential Scenario (about 54.1 percent more) and considerably reduced from the Maximum Commercial Scenario (about 24.9 percent less). The amount of RALI development under the 2010 Pier 70 Master Plan Alternative would be considerably reduced from that of the Proposed Project under both the Maximum Residential Scenario (about 38.7 percent less) and the Maximum Commercial Scenario (about 39.6 percent less).

Like the Proposed Project, which would have less-than-significant land use impacts as described in Section 4.B, Land Use and Land Use Planning, this alternative would not divide an established community and would not conflict with land use plans, policies, or regulations adopted for the

purpose of avoiding or mitigating an environmental effect, such that a substantial adverse physical change in the environment related to Land Use would result. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to land use and land use planning.

POPULATION AND HOUSING

Under the 2010 Pier 70 Master Plan Alternative, the residential population within the project site would be considerably reduced compared to the Proposed Project under either the Maximum Residential Scenario or Maximum Commercial Scenario, while the employee population would be considerably greater than that of the Proposed Project under the Maximum Residential Scenario and considerably less than that of the Maximum Commercial Scenario. Like the Proposed Project, which would have less-than-significant population and housing impacts as described in Section 4.C, Population and Housing, this alternative would not induce substantial population growth and would not displace any existing housing units or current on-site employees. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to population and housing.

CULTURAL RESOURCES

Archeological Resources

Compared with the Proposed Project, the 2010 Pier 70 Master Plan Alternative would have less potential for impacts on archeological resources due to less soils disturbance under the reduced grading program under this alternative, a reduced overall construction program, and because the 3.6-acre Hoedown Yard on PG&E property would not be developed under this alternative. However, under this alternative, potential impacts related to archeological resources would be substantially similar in character to those described for the Proposed Project in Section 4.D, Cultural Resources (disturbance of archeological resources, human remains, and tribal cultural resources, if such resources are present within the project site, and cumulative impacts). Mitigation Measure M-CR-1a: Archeological Testing, Monitoring, Data Recovery and Reporting, and Mitigation Measure M-CR-1b: Interpretation, identified and described for the Proposed Project, would also be applicable to this alternative to ensure that, similar to the Proposed Project, potential project-level impacts on archeological resources, if present within the project site, would be less than significant.

Like the Proposed Project which would have less-than-significant archeological resources impacts with mitigation as described in Section 4.D, Cultural Resources, this alternative, with

mitigation, would not cause a substantial adverse change in the significance of a historical resource or archeological resource, or disturb human remains. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to archeological resources.

Historic Architectural Resources

The 2010 Pier 70 Master Plan Alternative would include a development program that is consistent with the Port's Pier 70 Preferred Master Plan, and the existing Height and Bulk Districts of 65-X and 40-X would be increased to 90-X, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet. Under this alternative, six contributors to the UIW Historic District would be demolished (Buildings 11, 15, 16, 25, 32, and 66), instead of the seven under the Proposed Project (Building 117 within the project site would be demolished as part of a separate 20th Street Historic Core Building 117 Project, Case No. 2016-000346E.) Unlike the Proposed Project, under this alternative Building 19 (a one-story, corrugated metal warehouse along the northern edge of the 28-Acre Site) would be retained. As with the Proposed Project, historic Buildings 2, 12, and 21 would also be retained and rehabilitated in accordance with the *Secretary of the Interior's Standards*. As with the Proposed Project, the northern spur of Irish Hill (a contributing landscape feature of the UIW Historic District) would be removed. Building 21 would be relocated to the south of the 21st Street and to the east of the Louisiana Street alignment and rehabilitated according to *Secretary of the Interior's Standards*. The 2010 Pier 70 Master Plan Alternative would include approximately 2,153,330 gsf of new infill development, about 50 percent less development than under the Proposed Project, in part because there would be no development on the PG&E parcel under this alternative.

Similar to the Proposed Project, the less-than-significant impact associated with demolition of contributors to the UIW Historic District would be less-than-significant under this alternative. Improvement Measures I-CR-4a: Documentation and I-CR-4b: Public Interpretation would also apply to this alternative.

Similar to the Proposed Project, the significant impact under Impact CR-5 associated with rehabilitation of contributing buildings would also be significant under this alterative. As with the proposed project, Mitigation Measure M-CR-5: Preparation of Historic Resource Evaluation Reports, Review, and Performance Criteria, which would also apply to this alternative to reduce the impact of rehabilitation to a less-than-significant level.

The less-than-significant impacts associated with the demolition of contributing Building 19, specifically, under the Proposed Project, would be reduced to a level of no impact under this alternative, because this building would be retained.

The indirect impacts of new infill construction within the UIW Historic District under the 2010 Pier 70 Master Plan Alternative would be reduced when compared to the Proposed Project, as there would be about half the development under this alternative as under the Proposed Project. Similar to the Proposed Project, the maximum height of new infill development under this alternative would also be 90 feet, except for a 100-foot-wide portion adjacent to the shoreline that would remain at 40 feet. Compared to the Proposed Project, new infill development associated with this alternative would appear taller in some areas, and shorter in others, especially those areas closest to the shoreline, where buildings up to 90 feet in height could be developed along the entire Bay frontage, compared to heights of 50 to 70 feet along the central portion of the shoreline under the Proposed Project. Compared with the Proposed Project, views of the historic buildings to be retained would be somewhat more obscured from various public viewpoints, especially along the shoreline, from proposed infill development at 90 feet in height as well as a reduction of east-west oriented open space visually linking these historic buildings to the Bay.

Similar to the Proposed Project, however, new infill development would have a less-than-significant impact on the UIW Historic District, with implementation of Mitigation Measures M-CR-11: Performance Criteria and Review Process for New Construction, which would also apply to this alternative. As with the Proposed Project, the impacts on the UIW Historic District associated with the grading plan, changes to historic landscape elements such as Irish Hill, the demolition of non-contributory structures, and changes and additions to the network of streets and open spaces would also be less than significant under the 2010 Pier 70 Master Plan Alternative.

Like the Proposed Project, which would have less-than-significant historic architectural resources impacts with mitigation, as described in Section 4.D, Cultural Resources, this alternative, with mitigation, would not cause a substantial adverse change in the significance of a historic architectural resource. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to historic architectural resources.

TRANSPORTATION AND CIRCULATION

The 2010 Pier 70 Master Plan Alternative would include construction of a transportation network of improvements similar to those described for the Proposed Project. New Louisiana Street would be configured somewhat differently than under the Proposed Project, as shown on Figure 7.3, p. 7.58. In particular the jog connecting the southern segment of Louisiana Street to the segment north of 21st Street would instead be a longer diagonal southeast-to-northwest 43-foot-wide alley, ending in a "Y" with short alleys connecting to Maryland Street to the east and 20th Street to the north. Additionally, Maryland Street would not be designed and configured as a shared-use street; instead, it would be outfitted with typical sidewalks, curbs, and gutters, similar to the rest of the project streets. The TDM Program would be similar to that included in the

Proposed Project, except for those features related only to residential uses, as the 2010 Pier 70 Master Plan Alternative would include only 195 residential units.

Trip Generation

The travel demand for the 2010 Pier 70 Master Plan Alternative was calculated using methodologies and assumptions similar to those used for the Proposed Project and are based on the 2002 *San Francisco Transportation Impact Analysis Guidelines for Environmental Review* (*SF Guidelines*), and information to account for the mixed-use qualities and scale of the development program.[5] Thus, as for the Proposed Project, the person trip calculations for the 2010 Pier 70 Master Plan Alternative take into account person trips internal to the project site (e.g., trips from an office to a retail establishment on the site) as well as trips to or from points outside of the project site. With fewer dwelling units, and less office and RALI uses, the 2010 Pier 70 Master Plan Alternative would generate fewer person trips and fewer vehicle trips than the Proposed Project.

Table 7.11: 2010 Pier 70 Master Plan Alternative Trip Generation – Internal + External Person-Trips, compares person trips generated by each of the two scenarios analyzed for the Proposed Project to person trips generated by the 2010 Pier 70 Master Plan Alternative.

As shown in the table, the alternative would generate about 47.9 percent of the daily person-trips generated by the Maximum Residential Scenario, and about 44.5 percent of the daily person-trips generated by the Maximum Commercial Scenario.

Similarly, substantially fewer vehicle trips would be generated by the 2010 Pier 70 Master Plan Alternative than would be generated by either the Maximum Residential Scenario or the Maximum Commercial Scenario under the Proposed Project, as shown in Table 7.12: Vehicle Trip Generation, 2010 Pier 70 Master Plan Alternative. The 2010 Pier 70 Master Plan Alternative would generate a range of approximately 18,250 to 22,115 fewer vehicle trips compared to the Maximum Residential or Maximum Commercial Scenario.

As shown in Table 7.13: External Person Trips by Mode –2010 Pier 70 Master Plan Alternative, transit trips generated by the 2010 Pier 70 Master Plan Alternative also would be reduced: 1,247 a.m. peak hour trips compared to the range of 2,665 - 2,818 a.m. peak hour trips under the Proposed Project scenarios; 1,319 p.m. peak hour trips compared to the range of 2,893 – 2,809 p.m. peak hour trips under the Proposed Project scenarios; and 13,244 daily transit trips compared to the range of 22,423 – 26,018 daily transit trips under the Proposed Project scenarios.

[5] The analysis and results presented for the 2010 Pier 70 Master Plan Alternative are based on the information in the Fehr & Peers memorandum to Manoj Madhavan, Transportation Planner, regarding Pier 70 Alternatives Analysis, Transportation and Circulation, December 9, 2016.

Table 7.11: Comparison of Proposed Project and 2010 Pier 70 Master Plan Alternative Trip Generation - Internal + External Person Trips

Scenario	Number and Proportion of Person-Trips[1]					
	Daily		AM Peak Hour		PM Peak Hour	
Proposed Project - Maximum Residential Scenario						
Internal	24,300	18.5%	1,796	16.9%	3,643	23.0%
External	107,059	81.5%	8,809	83.1%	12,227	77.0%
Total	**131,359**	**100.0%**	**10,605**	**100.0%**	**15,870**	**100.0%**
Proposed Project - Maximum Commercial Scenario						
Internal	14,099	10.0%	1,046	9.7%	2,844	18.2%
External	127,266	90.0%	9,721	90.3%	12,808	81.8%
Total	**141,365**	**100.0%**	**10,767**	**100.0%**	**15,652**	**100.0%**
2010 Pier 70 Master Plan Alternative						
Internal	1,660	2.6%	114	3.0%	369	6.5%
External	61,195	97.4%	3,741	97.0%	5,301	93.5%
Total	**62,885**	**100.0%**	**3,855**	**100.0%**	**5,670**	**100.0%**

Note:
[1] Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2016

Table 7.12: Vehicle Trip Generation – Comparison of Proposed Project and 2010 Pier 70 Master Plan Alternative

Scenario	Number of Vehicle Trips[1]		
	Daily	AM Peak Hour	PM Peak Hour
Proposed Project - Maximum Residential Scenario			
In	15,508	1,954	1,885
Out	15,508	1,300	2,045
Total	**31,015**	**3,254**	**3,930**
Proposed Project - Maximum Commercial Scenario			
In	17,395	2,509	1,461
Out	17,395	930	2,462
Total	**34,790**	**3,439**	**3,923**
2010 Pier 70 Master Plan Alternative			
In	8,153	1,290	386
Out	8,153	133	1,311
Total	**16,305**	**1,423**	**1,697**

Note:
[1] Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2016

Table 7.13: External Person Trips by Mode – Comparison of Proposed Project and 2010 Pier 70 Master Plan Alternative

Scenario	Number and Proportion of Person-Trips[1]					
	Daily		AM Peak Hour		PM Peak Hour	
Proposed Project - Maximum Residential Scenario						
Auto Person Trips	54,109	50.5%	4,564	51.8%	6,251	51.1%
Transit Person Trips	22,423	20.9%	2,665	30.3%	2,893	23.7%
Walk/Bike/Other Person Trips	30,527	28.5%	1,579	17.9%	3,083	25.2%
Total	**107,059**	**100.0%**	**8,808**	**100.0%**	**12,227**	**100.0%**
Proposed Project - Maximum Commercial Scenario						
Auto Person Trips	63,827	50.2%	5,087	52.3%	6,632	51.8%
Transit Person Trips	26,018	20.4%	2,818	29.0%	2,809	21.9%
Walk/Bike/Other Person Trips	37,421	29.4%	1,816	18.7%	3,366	26.3%
Total	**127,266**	**100.0%**	**9,721**	**100.0%**	**12,807**	**100.0%**
2010 Pier 70 Preferred Master Plan Alternative						
Auto Person Trips	30,425	49.7%	2,005	53.6%	2,763	52.1%
Transit Person Trips	13,244	21.6%	1,247	33.3%	1,319	24.9%
Walk/Bike/Other Person Trips	17,526	28.6%	489	13.1%	1,218	23.0%
Total	**61,195**	**100.0%**	**3,741**	**100.0%**	**5,300**	**100.0%**

Note:
[1] Numbers may not sum to total due to rounding.

Sources: Fehr & Peers, 2016; Adavant Consulting, 2015

Construction Impacts

The types of travel generated by construction activities for the 2010 Pier 70 Master Plan Alternative would be similar to those of the Proposed Project, but with approximately 50 percent less development, would result in fewer total truck trips over the multi-year construction period. Localized transportation impacts during construction would remain less than significant, as for the Proposed Project. Improvement Measure I-TR-A: Construction Management Plan, would still be applicable to the alternative.

Operational Impacts

VMT Impacts

VEHICLE MILES TRAVELED ASSESSMENT

The average VMT per capita for individual uses would be the same for the 2010 Pier 70 Master Plan Alternative as for the Proposed Project. For residential development, the regional average daily household VMT per capita is 17.2. For office and retail development, regional average daily work-related VMT per employee is 19.1 and 14.9, respectively. The existing average daily VMT

per capita are 8.8, 14.6, and 10.8 for households, office employees, and retail visitors, respectively, for the transportation analysis zone where the project site is located.

Given that the project site is located in an area where the existing VMT per capita is more than 15 percent below the existing regional average, similar to the Proposed Project, the retail, office, and open space uses associated with the 2010 Pier 70 Master Plan Alternative would not result in substantial additional VMT and traffic impacts would be less than significant. Moreover, and also similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative would be located within a close proximity to a high-quality transit station and corridor, which also leads to a presumption that the 2010 Pier 70 Master Plan Alternative would not result in substantial additional VMT and that for that reason as well, traffic impacts would be less than significant.

INDUCED TRAVEL

The 2010 Pier 70 Master Plan Alternative would have a similar effect on induced travel as that described for the Proposed Project. As for the Proposed Project, the 2010 Pier 70 Master Plan Alternative would include features that would slightly alter the transportation network. These features would be sidewalk widening on adjacent streets, on-street loading zones, curb cuts, and on-street safety strategies and intersection signalization. These features fit within the general types of transportation network projects identified that would not substantially induce automobile travel. Therefore, as described for the Proposed Project, impacts would be less than significant for the alternative.

Traffic Impacts

The roadway network for the 2010 Pier 70 Master Plan Alternative would be the same as that of the Proposed Project. Therefore, no new traffic hazards would be created, and impacts would be less than significant, as for the Proposed Project.

Transit Impacts

Impacts on transit capacity utilization associated with the 2010 Pier 70 Master Plan Alternative would be somewhat less than with the Proposed Project. The Proposed Project was found to cause a significant and unavoidable impact to local Muni Route 48 Quintara/24th Street by increasing ridership beyond the 85 percent utilization threshold during both a.m. and p.m. peak hours. All other transit impacts of the Proposed Project were found to be less than significant

Using similar methodologies and assumptions as the analysis for the Proposed Project, transit trips for Project Alternatives were assigned to specific Muni routes. Since there were no significant impacts identified for the Proposed Project on any other Muni routes other than the 48 Quintara/24th Street, downtown screenlines, or regional screenlines and the 2010 Pier 70 Master

Plan Alternative would generate fewer transit trips than either of the Proposed Project scenarios, the alternative would also have a less than significant impact on those specific routes, the downtown screenlines and regional screenlines. Therefore, this analysis focused solely on Route 48 Quintara/24th Street to determine if the Project Alternatives would also cause significant impacts. As shown in Table 7.14: 48 Quintara/24th Street Capacity Utilization AM & PM –2010 Pier 70 Master Plan Alternative, the 2010 Pier 70 Master Plan Alternative would continue to increase ridership on Muni Route 48 beyond the 85 percent utilization threshold during the a.m. peak hour (outbound direction) and p.m. peak hour (inbound direction). The impact of the 2010 Pier 70 Master Plan Alternative on Muni transit capacity would therefore be a significant and unavoidable impact, similar to, although somewhat less than the impact resulting from the Proposed Project scenarios.

Section 4.E, Transportation and Circulation, identified Mitigation Measure M-TR-5, Monitor and increase capacity on the 48 Quintara/24th Street bus route as needed, which would provide additional capacity for the 48 Quintara / 24th Street route during the peak hours for the proposed project. As presented in Mitigation Measure M-TR-5, one option to accomplish this would be to add buses to this route [four (Maximum Residential) or six (Maximum Commercial) vehicles] during the peak hours, increasing the capacity of the route. Because the 2010 Pier 70 Master Plan Alternative would generate fewer transit riders than the Proposed Project, Mitigation Measure M-TR-5 would need to be modified to require project sponsors to purchase four new Muni vehicles, the same as for the Maximum Residential scenario but reduced from the six vehicles necessary to mitigate impacts under the Maximum Commercial scenario. This would increase the capacity of the route by a similar amount to the 2010 Pier 70 Master Plan Alternative's contribution to over-capacity conditions. Alternatively, as noted in Mitigation Measure M-TR-5, if preferable to SFMTA at the time of implementation, the Project Sponsor may contribute a comparable amount toward alternative measures to increase capacity along eh route, such as transit priority treatments, a change in fleet to higher-capacity vehicles, or initiation of a new route providing comparable service. However, as with the Proposed Project, SFMTA has not formally agreed to operate increased service on this route, and therefore cannot guarantee implementation of this mitigation measure, and its feasibility remains uncertain. The other three options discussed under Mitigation Measure M-TR-5 – to fund the addition of articulated buses, increase travel speeds, or add a new route – would also require additional operational and construction funding throughout the route and beyond the impacts caused by the 2010 Pier 70 Master Plan Alternative. Thus, the impact would remain significant and unavoidable with the 2010 Pier 70 Master Plan Alternative, similar to under the proposed project.

Table 7.14: 48 Quintara/24th Street Capacity Utilization A.M. & P.M. – Comparison of Baseline Plus Proposed Project with Baseline Plus 2010 Pier 70 Master Plan Alternative

	Baseline			Baseline Plus Project – Residential			Baseline Plus Project – Commercial			Baseline Plus 2010 Pier 70 Master Plan Alternative		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization	Alternative Trips	Alt Ridership	Alt Utilization
AM												
Inbound	119	252	47%	149	268	**106%**	118	237	**94%**	16	135	54%
Outbound	199	252	79%	224	423	**168%**	319	518	**206%**	189	388	**154%**
PM												
Inbound	160	252	63%	211	371	**147%**	274	434	172%	169	329	**131%**
Outbound	213	252	**85%**	196	409	**162%**	161	374	148%	47	260	**103%**

Note:

Bold indicates capacity utilization of 85 percent or greater.

Source: Fehr & Peers 2016.

Pedestrian Impacts

The pedestrian network and improvements for the 2010 Pier 70 Master Plan Alternative would be identical to those for the Proposed Project. Although the 2010 Pier 70 Master Plan Alternative would generate fewer pedestrian trips to/from the project site, impacts would remain the same. Pedestrian facilities within the project site would be improved and would accommodate pedestrian travel generated by the alternative. Pedestrian travel to and from the project site would be expected to occur from Illinois Street at 20th Street to the north and 22nd Street to the south, as assumed for the Proposed Project. Several barriers to accessible pedestrian travel currently exist along these off-site pedestrian routes and particularly on the east side of Illinois Street, at the access points to the project site. Impacts on pedestrian circulation associated with the 2010 Pier 70 Master Plan Alternative would be considered significant. Further, with implementation of Mitigation Measure M-TR-10: Improve pedestrian facilities on streets adjacent to and leading to the project site, identified for the Proposed Project under Impact TR-10, the impact associated with the 2010 Pier 70 Master Plan Alternative would be reduced to a less-than-significant level. This mitigation measure includes sidewalk widening, construction of new traffic signals at Illinois Street/20th Street and Illinois Street/22nd Street, as well as the relocation of obstructions such as fire hydrants and power poles (if feasible) to ensure an accessible path of travel is provided to and from the project site. Improvement Measure I-TR-B: Queue Abatement would ensure that queues from on-site, off-street parking facilities would not extend into the public right-of-way, which would reduce potential conflicts with pedestrians.

Bicycle Impacts

The 2010 Pier 70 Master Plan Alternative would increase bicycle trips in the project area, although to a lesser extent than either Proposed Project scenario. Bicyclists would continue to use various nearby bicycle routes to access the project site.

The Planning Code outlines specific requirements for Class 1 and Class 2 bicycle parking by land use, as summarized in Section 4.E, Transportation and Circulation, in the discussion under Impact TR-11. Specifically, the 2010 Pier 70 Master Plan Alternative would meet Planning Code requirements by providing 441 Class 1 and 217 Class 2 bicycle parking spaces.

The 2010 Pier 70 Master Plan Alternative bicycle trips would be accommodated within the proposed street and bicycle network, both on the project site and along nearby existing bicycle routes, and the proposed bicycle parking supply would meet requirements. Additionally, because the 2010 Pier 70 Master Plan Alternative would generate fewer auto trips than the Proposed Project, it would result in fewer bicycle conflicts than the Proposed Project. Similar to the Proposed Project, bicycle impacts for the 2010 Pier 70 Master Plan Alternative would be less than significant. No mitigation measures are required.

Loading Impacts

The delivery/service vehicle demand forecasts for the 2010 Pier 70 Master Plan Alternative are based on the methodology and truck trip generation rates presented in the *SF Guidelines*. Delivery/service vehicle demand is based on the types and amount of land uses proposed for the alternative. The 2010 Pier 70 Master Plan Alternative would generate a demand for 425 daily delivery/service vehicle-trips, consisting primarily of small trucks and vans. This corresponds to a peak demand for 20 loading spaces during an average hour of loading activities and 24 loading spaces during the peak hour of loading activities. The 2010 Pier 70 Master Plan Alternative would create less loading demand than either Proposed Project scenario.

The 2010 Pier 70 Master Plan Alternative would provide loading facilities similar to the Proposed Project, with both off-street and on-street loading spaces. The 2010 Pier 70 Master Plan Alternative would provide 22 loading spaces. This proposed loading supply would result in a shortfall of two loading spaces during the peak hour of loading. This shortfall is less than the 9-space shortfall under the Proposed Project; however, similar to the Proposed Project, loading impacts would be significant. Therefore, as with the Proposed Project, Mitigation Measure M-TR-12a, which directs that the project's Transportation Coordinator to coordinate with building tenants and delivery services to minimize deliveries during AM and PM peak periods, and Mitigation Measure M-TR-12b, which directs the project sponsor to conduct on- and off-street commercial loading space utilization studies after Phase 1 to determine whether or not conversion of general purpose on-street parking spaces to commercial loading spaces is warranted, would be applicable to the 2010 Pier 70 Master Plan Alternative. As with the Proposed Project, loading impacts would remain significant and unavoidable even with implementation of identified mitigation.

Emergency Access

Similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative's internal streets would be designed to accommodate emergency vehicle access. Although detailed designs have not yet been prepared for the roadways and intersections in this Alternative, the proposed roadway circulation network, including the "Y" intersection at Maryland Street/21st Street could likely be designed to accommodate emergency vehicle circulation. Additionally, the Proposed Project's traffic generation would not substantially affect emergency vehicle access. Because the 2010 Pier 70 Master Plan Alternative would generate somewhat fewer vehicle trips than the Proposed Project, its effect on emergency vehicle circulation would be less and would therefore also create a less than significant impact to emergency vehicle access.

2040 Cumulative Impacts

The Proposed Project would not cause any significant cumulative impacts to VMT, induced travel, other traffic hazards, pedestrian or bicycle circulation, loading, emergency access, or construction, and thus the 2010 Pier 70 Master Plan Alternative also would not result in a considerable contribution to significant cumulative impacts. This conclusion is based on the reduction in overall development under the alternative: it would result in only 195 residential units, substantially fewer than under either Proposed Project scenario; nearly 600,000 gsf more commercial space than under the Maximum Residential scenario; and about 60 percent of the RALI space compared to the Maximum Residential Scenario.

As under the Proposed Project, the 2010 Pier 70 Master Plan Alternative would cause a significant project-specific impact on local Muni route 48 Quintara/24th Street. The Proposed Project was found to contribute considerably to significant cumulative impacts on the 48 Quintara/24th Street and 22 Fillmore routes by increasing ridership more than 5 percent on a route expected to operate beyond the 85 percent utilization threshold during both AM and PM peak hours.

As shown on Table 7.15: 48 Quintara/24th Street Capacity Utilization AM & PM – Comparison of Cumulative with Proposed Project and Cumulative with 2010 Pier 70 Master Plan Alternative, under the 2010 Pier 70 Master Plan Alternative, Muni route 48 would operate beyond the 85 percent utilization threshold during both the a.m. (outbound only) and p.m. peak hours and also would contribute more than 5 percent to the total ridership, as for the Proposed Project. Mitigation Measure M-TR-5: Monitor and increase capacity on the 48 Quintara/24th Street bus route, would be modified under the 2010 Pier 70 Master Plan Alternative to require the purchase of four new vehicles. This mitigation measure would reduce the 2010 Pier 70 Master Plan Alternative's contribution to significant cumulative impacts on the 48 Quintara/24th Street bus route to less than significant, and therefore, Mitigation Measure M-C-TR-4A: Increase capacity on the 48 Quintara/24th Street bus routes as needed would not be required under the 2010 Pier 70 Master Plan Alternative and no additional mitigation is necessary. Mitigation Measure M-C-TR-4B: Increase capacity on the 22 Fillmore bus route under the Maximum Commercial Scenario, would not be required under the 2010 Pier 70 Master Plan Alternative, because the 22 Fillmore bus route is projected to operate within the 85 percent capacity utilization threshold under cumulative conditions with the 2010 Pier 70 Master Plan Alternative.

Table 7.15: 48 Quintara/24th Street Capacity Utilization A.M. & P.M. – Comparison of Cumulative with Proposed Project and Cumulative with 2010 Pier 70 Master Plan Alternative

	Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial			Cum. Plus 2010 Pier 70 Master Plan Alternative		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization	Alternative Trips	Alt Ridership	Alt Utilization
AM												
Inbound	95	252	38%	149	244	**97%**	118	213	85%	16	111	44%
Outbound	244	252	**97%**	224	468	**186%**	319	563	**223%**	189	433	**172%**
PM												
Inbound	184	252	73%	211	395	**157%**	274	458	**182%**	169	353	**140%**
Outbound	175	252	69%	196	371	**147%**	161	336	**133%**	47	222	**88%**

Note:

Bold indicates capacity utilization of 85 percent or greater.

Source: Fehr & Peers 2016.

Parking

Due to the requirements within SB 743, which apply to the Proposed Project and the 2010 Pier 70 Master Plan Alternative, San Francisco does not consider parking conditions to be environmental impacts as defined by CEQA for this project; however, Project parking demand/supply is of interest to the public and decision makers. Peak parking demand for the alternative was calculated using the same methodologies as for the Proposed Project. The 2010 Pier 70 Master Plan Alternative would have a parking demand of approximately 4,022 spaces during the mid-day peak parking period, approximately 3,056 fewer than the parking demand from the Maximum Residential Scenario and 3,611 fewer than the Maximum Commercial Scenario. These differences are due to the lower intensity of land uses included in the 2010 Pier 70 Master Plan Alternative than in either Proposed Project scenario.

The 2010 Pier 70 Master Plan Alternative would provide approximately 405 on-street parking spaces and 2,120 off-street spaces, for a total of 2,525 parking spaces. This supply would not accommodate the calculated demand for parking on the project site. As with the Proposed Project, the lack of parking may result in motorists looking for parking outside of the project site. However, existing and proposed residential permit parking areas in the vicinity would discourage spillover parking from the 2010 Pier 70 Master Plan Alternative. Some drivers would shift to public transit or other modes of travel such as bicycling, use carshare facilities when a vehicle is needed, and would not own a car. It is possible that such a shift from automobile use to transit would add additional demand to public transit facilities.

NOISE AND VIBRATION

While the level of development under the 2010 Pier 70 Master Plan Alternative would be less than the Proposed Project, it would be more than the Code Compliant Alternative. The same types of building demolition, rehabilitation, and construction activities would still occur. Therefore, construction-related noise and vibration impacts under this alternative would be similar to the Proposed Project (Impacts NO-1, NO-2, and NO-3). Like the Code Compliant Alternative, there would be less excavated materials hauled off-site and less materials delivered to the site (i.e., fewer haul/delivery truck trips) than under either scenario of the Proposed Project. Under this alternative, Mitigation Measures M-NO-1: Construction Noise Control Plan, M-NO-2: Noise Control Measures During Pile Driving, and M-NO-3: Vibration Controls Measures During Construction would still be required to reduce this alternative's construction-related impacts. Implementation of Mitigation Measures M-NO-1 and M-NO-3 would reduce construction-related noise and vibration impacts identified in Impacts NO-1 and NO-3 to less than significant. However, like the Proposed Project, pile driving noise impacts under this alternative (Impact

NO-2) would still be significant and unavoidable even with implementation of Mitigation Measure M-NO-2.

Under this alternative, building heights could exceed 70 feet, like the Proposed Project, so noise issues associated with stationary sources including HVAC and rooftop emergency generators would be the same as the Proposed Project (Impact NO-4). Like the Proposed Project, Mitigation Measure M-NO-4 would still be required under this alternative for such rooftop equipment and this impact would be mitigated to a less-than-significant level under this alternative with implementation of Mitigation Measure M-NO-4.

Because the level of development under this alternative would be less than either scenario of the Proposed Project and less traffic would be generated, traffic noise increases would likewise be less. Table 7.7, p. 7.35 above, compares significant traffic increases under this alternative to those identified for the Proposed Project. There would be two road segments under this alternative with significant traffic noise increases, as compared with six segments under either scenario of the Proposed Project (Impact NO-5). While this alternative would have fewer road segments with significant traffic noise increases than the Proposed Project, it would have one more road segment with significant traffic noise increases than the Code Compliant Alternative. However, implementation of Mitigation Measure M-AQ-1f: Transportation Demand Management could result in traffic reductions of up to 20 percent, and such reductions could provide noise level reductions of up to 1 dBA, which would be sufficient to reduce traffic noise increases on one of the two road segments to less-than-significant levels. Like the Proposed Project and Code Compliant Alternative, traffic noise increases on 22nd Street east of Illinois would still be significant.

Despite the increase of nearly 11 dBA on 22nd Street (east of Illinois Street) under the 2010 Pier 70 Master Plan Alternative, residential uses are not proposed along this segment of 22nd Street under this alternative. No mitigation measures are necessary to maintain acceptable noise levels for residential uses along 22nd Street.

Like the Proposed Project, this alternative would also have a mix of residential, commercial, and RALI uses. The location of residential uses under this alternative would be limited to one parcel adjacent to Illinois Street, and therefore, it is expected that the noise compatibility issues identified for the Proposed Project in this same area would still occur under this alternative (Impact NO-6). However, this alternative would have a greater potential for noise disturbance at these residences because the Hoedown Yard would continue to operate, but in proximity to future residential uses. In addition to noise levels being higher in the Hoedown Yard vicinity, the nature of the noise (i.e., heavy equipment operations, with materials being loaded/unloaded to/from trucks) would increase the potential for noise disturbance of any nearby future residents. Since there would be no residential uses in proximity to future commercial office and RALI uses,

potential noise conflicts between future residents and other future uses and activities in open space areas identified for the Proposed Project would not occur under the 2010 Pier 70 Master Plan Alternative.

Since the 2010 Pier 70 Master Plan Alternative's construction-related noise and vibration impacts would be similar to the Proposed Project, construction-related cumulative noise impacts would be less than significant and this alternative's contribution to cumulative construction noise increases would also be like the Proposed Project, less than cumulatively considerable (Impact C-NO-1).

This alternative's contribution to cumulative operational traffic noise increases would be substantially less than the Proposed Project but slightly more than the Code Compliant Alternative. Table 7.8, pp. 7.37-7.39 above, compares significant cumulative traffic noise increases under this alternative to those identified for the Proposed Project. When compared to 2040 cumulative noise levels (cumulative baseline), this alternative would avoid the significant cumulative noise increases that would occur under either scenario of the Proposed Project (Impact C-NO-2).

When compared to 2020 baseline noise levels, this alternative would substantially reduce the number of roadway segments subject to significant noise increases (decreasing from 20 roadway segments with noise increases exceeding the 3-dBA/5-dBA thresholds to six roadway segments; one more than the Code Compliant Alternative, 20th Street west of Illinois Street)). With implementation of Mitigation Measure M-AQ-1f, Transportation Demand Management, these increases could be reduced by up to 1.0 dB, and all but two of these significant cumulative noise increases would be reduced to less than significant. Although there would still be a significant and unavoidable cumulative impact under this alternative for two roadway segments (20th Street east of Illinois Street and 25th Street east of Third Street), the degree of impact on both of these segments would be less than the Proposed Project. This alternative's contribution to this cumulative impact would still be cumulatively considerable, but substantially less than the Proposed Project and slightly more than the Code Compliant Alternative. It is noted that although the incremental noise increases on these two roadway segments are considered to be significant (exceeding the 5-dBA threshold), no adverse noise impacts would occur because no noise-sensitive land uses are planned for the affected section of 20th Street and the affected section of 25th Street is developed with industrial uses.

AIR QUALITY

Impacts During Construction

The developed square footage under the 2010 Pier 70 Master Plan Alternative would be greater than that of the Code Compliant Alternative but less than that of the Proposed Project.

As described in Section 4.G, Air Quality, estimated construction-related emissions of ROG and NOx for the Proposed Project would exceed the applicable significance thresholds during construction of Phases 3, 4 and 5 with operational emissions from the previously constructed Phases 1 and 2. Even with implementation of Mitigation Measures M-AQ-1a (Construction Emissions Minimization) through M-AQ-1h, emissions would exceed the significance thresholds with ROG levels at 155 pounds per day, NOx levels at 89 pounds per day, and PM_{10} levels at 135 pounds per day during construction of Phase 5 under the Maximum Commercial Scenario. Under the Code Compliant Alternative, NOx and PM_{10} would be reduced to below their respective significance thresholds during construction of Phases 4 and 5 and operation of the previous phases, but emissions of ROG would remain significant and unavoidable. As shown in Table 7.9, p. 7.42, the sum of construction-related and concurrent operational ROG emissions for the Code Compliant Alternative would be 66 pounds per day with implementation of Mitigation Measure M-AQ-1a through M-AQ-1h.

Because the development metrics of the 2010 Pier 70 Master Plan Alternative would fall between those of the Code Compliant Alternative and the Proposed Project, the resultant construction-related emissions would also be more than those of the Code Compliant Alternative but less than those of the Proposed Project. Like the Proposed Project and Code Compliant Alternative, air quality impacts during construction of the 2010 Pier 70 Master Plan Alternative would be significant and unavoidable with Mitigation Measures M-AQ-1a through Mitigation Measure M-AQ-1h.

Operational Impacts

Like the Proposed Project, operational impacts of the 2010 Pier 70 Master Plan Alternative would be significant and unavoidable even with mitigation. As described in Section 4.G, Air Quality, estimated operational emissions of ROG, NOx and PM_{10} under the Proposed Project would be 154, 84 and 77 pounds per day, respectively, under the Maximum Residential Scenario and 157, 87 and 84 pounds per day, respectively, under the Maximum Commercial Scenario exceeding significance thresholds.

The 2010 Pier 70 Master Plan Alternative would result in fewer vehicle trips compared to the Proposed Project Scenarios but greater vehicle trips than that of the Code Compliant Alternative. As discussed above, the Code Compliant Alternative would generate 12,690 vehicle trips per weekday compared to the 16,193 vehicle trips per weekday generated by the 2010 Pier 70 Master Plan.[6] The Code Compliant Alternative would also construct less square footage of development than that of the 2010 Pier 70 aster Plan Alternative. Additionally, while the Proposed Project

[6] Adavant, Consulting, Pier 70 Special Use District – Alternatives, Technical Trip Generation Tables, received via e-mail, from A. Kosinski of Fehr and Peers on June 1, 2016.

would have 11 parcels with building heights that would require backup diesel generators, the 2010 Pier 70 Master Plan Alternative would have 8 parcels with building heights that would require backup diesel generators and result in criteria air pollutant emissions, requiring implementation of Mitigation Measure M-AQ-1b: Diesel Backup Generator Specification. Therefore, since the calculated mitigated operational criteria pollutant emissions of the Code Compliant Alternative would result in ROG emissions that exceed the significance threshold of 54 pounds per day as discussed above, the 2010 Pier 70 Master Plan Alternative would generate more emissions and would also result in operational emissions that would be significant and unavoidable with mitigation.

Toxic Air Contaminants

Similar to the Proposed Project, construction and operation of the 2010 Pier 70 Master Plan Alternative would generate toxic air contaminants, including diesel particulate matter from construction equipment. Additionally, while the Proposed Project would have 11 parcels with building heights that would require backup diesel generators, the 2010 Pier 70 Master Plan Alternative would have 8 parcels with building heights that would require backup diesel generators and result in DPM emissions.

As discussed above, the 2010 Pier 70 Master Plan Alternative would generate fewer vehicle trips than the Proposed Project. Additionally the 2010 Pier 70 Master Plan Alternative would result in reduced square footage of development and reduced construction emissions of exhaust-emitted $PM_{2.5}$. Like the Proposed Project (see Table 4.G.14: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Maximum Residential Scenario at Off-Site Receptors, and Table 4.G.15: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Maximum Commercial Scenario at Off-Site Receptors, in Section 4.G, Air Quality, p. 4.G.66 and p. 4.G.67, respectively), resultant $PM_{2.5}$ concentrations at off-site receptor locations would be below significance thresholds for construction and operation of the 2010 Pier 70 Master Plan Alternative. Similarly, like the Proposed Project (see Table 4.G.16: Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions at the Maximally Impacted On-Site Receptors, p. 4.G.68), resultant $PM_{2.5}$ concentrations at on-site receptor locations would be below significance thresholds for construction and operation. Therefore, the 2010 Pier 70 Master Plan Alternative would not result in sensitive receptor locations meeting the APEZ criteria for $PM_{2.5}$, and impacts related to construction and operational $PM_{2.5}$ concentrations would be less than significant.

The 2010 Pier 70 Master Plan Alternative would result in reduced square footage of development and reduced construction emissions of exhaust-emitted DPM compared to the Proposed Project. Similarly, the lifetime cancer risk at on-site receptors under the 2010 Pier 70 Master Plan Alternative would be less than significant with mitigation, like the Proposed Project, and the same mitigation measure would apply to this alternative. For the Proposed Project (see Table 4.G.16),

the unmitigated risk to on-site receptors would exceed the significance threshold but implementation of Mitigation Measure M-AQ-1a: Construction Emissions Minimization would reduce the health risk impact to less than significant.

For the 2010 Pier 70 Master Plan Alternative, implementation of Mitigation Measure M-AQ-1a would also ensure that increased cancer risk at the maximally affected sensitive receptors would be below the threshold of 100 in one million. Furthermore, at no location, would cumulative excess cancer risk exceed 100 per one million persons exposed with implementation of Mitigation Measure M-AQ-1a with additional reduction from Mitigation Measure M-AQ-1b which would be required to address emissions from criteria air pollutants, as described above. Therefore, the 2010 Pier 70 Master Plan Alternative would not result in sensitive receptor locations meeting the APEZ criteria for excess cancer risk, and construction and operational cancer risk would be less than significant with mitigation.

Consistency with Clean Air Plan

Like the Proposed Project, impacts related to consistency with the 2010 CAP for the 2010 Pier 70 Master Plan Alternative would be less than significant with mitigation.

Under the 2010 Pier 70 Master Plan Alternative there would be fewer vehicle trips and fewer buildings over 70 feet that would require backup diesel generators, resulting in fewer emissions.

The 2010 Pier 70 Master Plan Alternative would align with the applicable recommended measures of the 2010 CAP in the same manner as presented for the Proposed Project in Table 4.G.17: Control Strategies of the 2010 Clean Air Plan, pp. 4.G.71-74. Like the Proposed Project, it would require implementation of the TDM Program (see Chapter 2, Project Description, pp. 2.51), Mitigation Measure M-TR-4 to improve local bus service if SFMTA acknowledges it is warranted, and Mitigation Measure M-AQ-1f, which would require implementation of additional TDM measures. The additional inclusion of bike lanes and unbundled parking would ensure consistency with applicable Transportation Control Measures contained in the 2010 CAP. Applicable Mobile Source Control measures of the 2010 CAP would be implemented via Mitigation Measure M-AQ-1g and Mitigation Measure M-AQ-1h. Energy and Climate Measures of the 2010 CAP would be addressed through compliance with the City's Green Building Requirements for energy efficiency and renewable energy as well as the inclusion of open space into the 2010 Pier 70 Master Plan Alternative. The 2010 Pier 70 Master Plan Alternative would also not hinder implementation of the 2010 CAP. Therefore, the 2010 Pier 70 Master Plan Alternative would not conflict with, or obstruct implementation of the 2010 CAP, and this impact would be less than significant with mitigation.

Odors

Although there may be some potential for small-scale, localized odor issues to emerge around uses under the 2010 Pier 70 Master Plan Alternative such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site and off-site sensitive receptors would be unlikely. BAAQMD Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds and applies to restaurants that employ more than five persons. Therefore, like the Proposed Project, this alternative would not create objectionable odors that would affect a substantial number of people.

Cumulative Air Quality Impacts

Like the Proposed Project, the cumulative air quality impacts of the 2010 Pier 70 Master Plan Alternative would be significant and unavoidable with mitigation. Because the Proposed Project would result in both construction and operational emissions of ROG, NOx and PM_{10} exceeding their respective significance thresholds, the Proposed Project's contribution to cumulative air quality impacts is considered significant and unavoidable, even with mitigation. Similarly, the 2010 Pier 70 Master Plan Alternative would result in significant and unavoidable air quality impacts from emissions of ROG after implementation of feasible mitigation measures, and consequently, would result in a cumulatively considerable contribution to regional and local air quality impacts. Therefore, this impact would be significant and unavoidable with mitigation.

The 2010 Pier 70 Master Plan Alternative would result in a similar cumulative health risk impact as the Proposed Project, which was determined to be less than significant with implementation of Mitigation Measure M-AQ-1a: Construction Emissions Minimization.

Although the 2010 Pier 70 Master Plan Alternative would result in fewer vehicle trips and building heights would be reduced such that fewer backup diesel generators would be required, the 2010 Pier 70 Master Plan Alternative would result in a similar cumulative health risk impact as the Proposed Project, which was determined to be less than significant with implementation of Mitigation Measure M-AQ-1a, primarily as the result of construction-related emissions of DPM. As discussed for the proposed project, 2040 cumulative heath risk modeling is based on growth projections that would have reasonably accounted for the traffic emissions from the reasonably foreseeable projects listed in Section 4.A, Introduction to Chapter 4, pp. 4.A.9-4.A-18. That modeling shows future background risks are projected to be reduced in 2040 compared to existing conditions as a result of improved vehicle fleets and the electrification of Caltrain. Therefore, by adding the project's risks on top of 2040 health risk conditions, the 2010 Pier 70 Master Plan Alternative with mitigation would not result in new locations meeting the APEZ criteria that otherwise would not.

GREENHOUSE GAS EMISSIONS

A variety of controls are in place to ensure that development in San Francisco would not impair the State's ability to meet Statewide GHG reduction targets outlined in AB 32, nor impact the City's ability to meet San Francisco's local GHG reduction targets. Projects that are consistent with San Francisco's GHG reduction strategy would not contribute significantly to global climate change. Similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative would be required to comply with these regulations and requirements that reduce GHG emissions and would be consistent with San Francisco's GHG reduction strategy. As with the Proposed Project, this alternative would introduce a mixed-use development in an area that is served by public transit, and would include Class I and Class II bicycle parking spaces, energy efficiency features beyond Title 24 requirements, low-impact stormwater management design, water-efficient landscaping, water-conserving interior design, convenient recycling and composting, street trees, and other features consistent with San Francisco's ordinances and requirements. Similar to the proposed project, development would be consistent with the Sustainable Communities Strategy by including residential and commercial uses in a designated Priority Development Area per Plan Bay Area, furthering the region's goals for reducing GHG emissions. Therefore, as with the Proposed Project, the 2010 Pier 70 Master Plan Alternative would have a less than cumulatively considerable contribution to significant cumulative GHG impacts.

WIND AND SHADOW

Under the 2010 Pier 70 Master Plan Alternative, buildings would range from 50 to 90 feet in height, with the majority 90 feet tall and located at the eastern end of the project site along the waterfront (see Figure 7.4 on p. 7.60). The 3.6-acre Hoedown Yard at the southwestern corner of the project site would not be developed. An 85-foot-tall building (on Parcel 3A) would be located to the north of the unoccupied site along Illinois Street, and an 80-foot-tall building (on Parcel 7A) would be located to the east of the unoccupied site and east of Louisiana Street. All other interior buildings would be 50 to 55 feet tall. Under this alternative, the taller buildings are situated along the outer perimeter of the project site, and are comparable in height to the tallest buildings under the Proposed Project. Under this alternative, there would be less public open space, with 8.07 acres in total compared to 9 acres under the Proposed Project.

Wind

Proposed buildings near the northwestern corner of the project site would be taller than existing development to the north, northwest, and west, and they would be exposed to prevailing winds. Under this alternative, these buildings would result in a slight wind acceleration on Illinois Street, the unoccupied Hoedown Yard, and at the north and west façades of these buildings when

compared to the existing wind conditions.[7] Overall, the resulting wind impacts within the project site and vicinity would be similar to the impacts under the Proposed Project in that there would be a substantially lower number of areas where winds would exceed the 11 mph comfort criterion compared to the existing conditions. However, the overall wind speeds would likely be somewhat higher than those under the Proposed Project due to the taller buildings proposed under the 2010 Pier 70 Master Plan Alternative.

Under this alternative, no new hazard locations would be added in the interior areas of the project site when compared to the wind tunnel test results for the existing and Proposed Project configurations. However, winds could exceed the hazard criterion at two new locations – one at the southwestern corner of Parcel 3A on Illinois Street and the other at the northwestern corner of Parcel 7A. For the Proposed Project, winds were predicted to exceed the hazard criterion at one off-site location to the north of the project site. It is likely that winds at that location would not be influenced by the 2010 Pier 70 Master Plan Alternative and could potentially continue to exceed the hazard criterion.

Under the Proposed Project plus cumulative development scenario, cumulative projects would not have a substantial influence on the wind conditions on and around the project site when compared to the baseline surroundings. As under the Proposed Project, cumulative projects would be relatively low in height and separated from the project site by a few blocks under the 2010 Pier 70 Master Plan Alternative. For these reasons, under the 2010 Pier 70 Master Plan Alternative, cumulative projects are not expected to cause any substantial difference in wind conditions on the project site.

Under the 2010 Pier 70 Master Plan Alternative, wind speeds would be increased overall when compared to those under the Proposed Project. Like the Proposed Project, which would have less-than-significant wind impacts as described in Section 4.I, Wind and Shadow, this alternative, with mitigation, would not alter wind in a manner that substantially affects public areas. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to wind.

Shadow

The new buildings within the project site under this alternative would be shorter than those under the proposed project. As such, shadow under this alternative would not reach any existing public open spaces in the vicinity of the project site (including the future Crane Cove Park) at any time

[7] Neetha Vasan and Frank Kriksic, RWDI, Consulting Engineers and Scientists, *Memorandum: Pedestrian Wind Analysis – Review of DEIR Alternatives, Pier 70 Mixed-Use District Project*, June 17, 2016.

of year from one hour after sunrise to one hour before sunset. Under this alternative shadow impacts on existing streets within the vicinity of the project site would be less than those of the proposed project, commensurate with the lower building heights within the project site.

Under the 2010 Pier 70 Master Plan Alternative, shadow would be increased overall when compared to shadow under the Proposed Project. Like the Proposed Project, which would have less-than-significant shadow impacts, as described in Section 4.I, Wind and Shadow, the 2010 Pier 70 Master Plan Alternative would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas. It would therefore have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to shadow.

The discussion of shadow from new buildings on public open spaces that would be constructed within the project site under the 2010 Pier 70 Master Plan Alternative is provided for informational purposes.

Under the 2010 Pier 70 Master Plan Alternative, building heights would be comparable to those of the Proposed Project but would be distributed differently. The majority of new buildings would be 90 feet tall and would line the eastern end of the project site along the waterfront. A 80-foot-tall building would also occupy the southcentral portion of the project site. An 85-foot-tall building would occupy the northwest corner. Under this alternative, there would be less public open space (8.07 acres in total, compared to 9 acres under the Proposed Project). For this reason, shadow under this alternative would affect a smaller area of public open space, such that shadow under this alternative would occupy a comparatively greater proportion of the reduced open space provided under this alternative.

Shadow from buildings within the project site under this alternative would behave in a similar fashion as under the Proposed Project. Shadows would be longest at sunrise and sunset when the sun is lowest in the sky and shortest at midday when the sun is highest in the sky. At sunrise, when the sun is in the eastern sky, shadows would reach westward. As the morning progresses, shadows would sweep eastward while growing shorter. At midday, shadows would reach northward and would be at their shortest. From midday, shadows would continue to sweep eastward while growing longer through the afternoon and into the early evening until sunset. Thus, shadow is ephemeral and generally moves across properties from west to east in a clockwise sweep radiating from the project site.

The shadow on the waterfront park under this alternative would be qualitatively similar to that described for the Waterfront Terrace and Waterfront Promenade open spaces under the Proposed Project in Section 4.I, Wind and Shadow. Shadow on the waterfront parks under this alternative would be increased somewhat due to the placement of 90-foot-tall buildings along the length of

the waterfront and due to the absence of the Slipways Commons open space, which, under the Proposed Project, would create a sunny gap between shadows cast on the Waterfront Terrace and Waterfront Promenade open spaces by buildings to its north and south during afternoons for most of the year.

As with the Proposed Project, shadow from this alternative would not substantially affect the use of the proposed network of open spaces. As new public open spaces would be created under this alternative, shadow from new buildings constructed under this alternative would not interfere with any existing recreational uses within the project site or any existing recreation-based expectations for sunlight on these spaces. During peak hours of use throughout most of the year, the open spaces under this alternative would be mostly or substantially in sun and are assumed to provide ample seating opportunities in sunny locations for users who prefer sun, as well as shady locations for those who prefer shade.

RECREATION

The 2010 Pier 70 Master Plan Alternative would reduce the amount of open space provided on the project site from about 9 acres under the Proposed Project, to 8.07 acres (by 10.3 percent). However, as discussed above under Population and Housing for this alternative, the residential population within the project site would be considerably reduced as compared to the Proposed Project under either scenario due to this alternative's reduced number of residential units (195 units) compared to the Proposed Project under the Maximum Residential Scenario (3,025 units) or the Maximum Commercial Scenario (1,645 units).

Like the Proposed Project, which would have less-than-significant recreation impacts, as described in Section 4.J, Recreation, this alternative would not increase the use of recreational facilities such that physical deterioration of the facilities would be accelerated, would not require construction of new or expanded recreational facilities, and would not physically degrade existing recreational resources. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to recreation.

UTILITIES AND SERVICE SYSTEMS

The 2010 Pier 70 Master Plan Alternative would include approximately 50 percent less square footage of development than the Proposed Project. The potable water and wastewater demands under this alternative would increase relative to existing conditions, but would be less than under the Proposed Project. However, similar to the Proposed Project, new water and wastewater infrastructure would be constructed at the project site to accommodate the increased flows, including the new components of the combined sewer system and the 20th Street Pump Station

that would be constructed under the Proposed Project. Similar to the Proposed Project, development under the 2010 Pier 70 Master Plan Alternative would trigger the requirements of the City's Stormwater Management Requirements and Design Guidelines, and stormwater flows to the combined sewer system would be reduced by up to 25 percent. Because the wastewater flows would be less than under the Proposed Project, the flows would remain within the capacity of the SEWPCP. As for the Proposed Project, cumulative wastewater flows could exceed the downstream conveyance capacity of the City's combined sewer system. However, as for the Proposed Project, the 2010 Pier 70 Master Plan Alternative's contribution to this cumulative impact would not be cumulatively considerable with implementation of Mitigation Measure M-C-UT-1: SFPUC Coordination. This mitigation measure requires the project sponsors to coordinate with the SFPUC to ensure that there is sufficient downstream capacity to convey project-related wastewater flows to the SEWPCP before future developments may be occupied. Implementation of this mitigation measure would ensure that flows under this alternative would not exceed the capacity of the combined sewer system.

Like the Proposed Project, which would have less-than-significant impacts on utilities and service systems with mitigation, as described in Section 4.K, Utilities and Service Systems, this alternative, with mitigation, would not exceed applicable wastewater treatment requirements, require construction or expansion of water, wastewater or stormwater facilities, would not require new or expanded water supply resources or entitlements, would not result in a determination that that project has inadequate wastewater treatment capacity, would be served by a landfill with sufficient capacity, and would comply with Federal, State and local statutes and regulations related to solid waste. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to utilities and service systems.

PUBLIC SERVICES

As discussed above under Population and Housing for the 2010 Pier 70 Master Plan Alternative, the residential population within the project site would be considerably reduced as compared to the Proposed Project under either scenario, while the employee population would be considerably greater than that of the Proposed Project under the Maximum Residential Scenario and considerably less than that of the Maximum Commercial Scenario. As with the Proposed Project, this alternative would not adversely affect the ability for the project site to be adequately served by existing police protection, fire protection and emergency medical services, public school facilities, and public libraries.

Similar to the Proposed Project, which would have less-than-significant impacts, as described in Section 4.L, Public Services, this alternative would not result in adverse physical impacts associated with the provision of, or need for, new or physically altered facilities in order to

maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire and emergency medical protection, police protection, schools, libraries, or other services, the construction of which could cause significant environmental impacts. As such, the 2010 Pier 70 Master Plan Alternative would not have any significant project-level impacts, and would not make a considerable contribution to a significant cumulative impact related to public services.

BIOLOGICAL RESOURCES

Compared with the Proposed Project, the 2010 Pier 70 Master Plan Alternative would have less potential for impacts on biological resources due to less soils disturbance under the alternative's reduced grading program, a reduced overall construction program, and because the 3.6-acre Hoedown Yard on PG&E property would not be developed. However potential impacts on biological resources would be substantially similar in character to terrestrial and marine biological impacts analyzed for the Proposed Project with respect to ground disturbance, land conversion, geotechnical stabilization, and infrastructure development.

This alternative includes construction of an engineered berm along the eastern property boundary and riprap along the water's edge to address projected sea level rise flooding risks. Similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative would require a certification and/or waste discharge requirements from the RWQCB and a permit from BCDC for development within the shoreline band of the Bay.

Similar to the Proposed Project, which would have less-than-significant biological resources impacts with mitigation, as described in Section 4.M, Biological Resources, this alternative, with mitigation, would not have a substantial adverse effect on a candidate, sensitive or special status species, riparian habitat, sensitive natural community, or on Federally protected wetlands; would not interfere with the movement of any migratory fish or wildlife species; would not conflict with any local polies or ordinances protecting biological resources; and would not conflict with an adopted habitat conservation plan, natural community conservation plan or other approved habitat conservation plan. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to biological resources.

GEOLOGY AND SOILS

The gross square footage of development under the 2010 Pier 70 Master Plan Alternative is approximately 50 percent less than under the Proposed Project, and the development footprint is also smaller than the Proposed Project because the 3.6-acre Hoedown Yard on PG&E property would not be developed. New development under this alternative would all be constructed on

Port property and would be required to comply with the Port of San Francisco Building Code to reduce seismic hazards. As for the Proposed Project, existing Buildings 2, 12, and 21 would be improved to meet seismic safety building code requirements which would ensure that seismic impacts would be less than significant. Because the extent of soil disturbance would be less than the Proposed Project the potential for soil erosion and creation of unstable slopes is less than would occur under the Proposed Project. This alternative includes the same street network improvements. Although the northern spur of the Irish Hill remnant would be removed for construction of the new 21st Street, this would also occur under the Proposed Project. Therefore, this alternative would result in the same impacts related to changes in topography as would the Proposed Project. The Hoedown Yard is underlain by Franciscan Complex which is considered paleontologically sensitive. Because the Hoedown Yard would not be developed under this alternative, there would be less disruption of the Franciscan Complex bedrock and less of the related potential to disturb paleontological resources. Fewer structures would be constructed near Irish Hill and exposed bedrock cuts, therefore this alternative would result in less risks related to rockfall hazards. However, implementation of Mitigation Measure M-GE-3a: Reduction of Rockfall Hazards requiring the use of active controls or setbacks to reduce risks associated with rock falls would be necessary to reduce this impact to a less-than-significant level. Relative to the Proposed Project, this alternative would result in similar risks related to use of the dilapidated pier, assuming implementation of Mitigation Measure M-GE-3b: Signage and Restricted Access to Piers to restrict access to the existing dilapidated pier.

Like the Proposed Project which would have less-than-significant geology and soils impacts with mitigation as described in Section 4.N, Geology and Soils, this alternative, with mitigation, would not expose people or structures to seismic risks, would not result in substantial soil erosion or the loss of topsoil, would not be located on geologic unit or soil that is unstable, and would not substantially change the topography or any unique geologic or physical features of the site, including paleontological resources. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to geology and soils.

HYDROLOGY AND WATER QUALITY

The gross square footage of development under the 2010 Pier 70 Master Plan Alternative is approximately 50 percent less than under the Proposed Project, and the development footprint is also smaller than the Proposed Project because the 3.6-acre Hoedown Yard on PG&E property would not be developed. The wastewater demands under this alternative would increase relative to existing conditions, but would be less than under the Proposed Project. The volume of stormwater discharged to the City's combined sewer system would be less than would occur under wastewater and stormwater Option 1 of the Proposed Project because the Hoedown Yard

would not be developed. Similar to the Proposed Project, this alternative includes construction of new wastewater and stormwater infrastructure, including a new 20th Street Pump Station. The change in wastewater and stormwater flows could potentially cause the frequency of CSDs from the 20th Street sub-basin and/or downstream basins to increase beyond the long-term average of 10 CSD events per year, in violation of the Bayside NPDES permit. However, assuming implementation of Mitigation Measure M-HY-2a: Design and Construction of Proposed Pump Station for Options 1 and 3, which specifies performance standards for the pump station, this impact would be less than significant as for the Proposed Project.

Because the development footprint would be less than the Proposed Project and the amount of impervious surfaces created would be less, water quality impacts related to the potential for soil erosion, groundwater dewatering, alteration of drainage patterns, and groundwater depletion and interference with groundwater recharge would be less than would occur under the Proposed Project. Similar to the Proposed Project, this alternative would include construction of shoreline improvements and repairs to the CSD outfalls which could result in water quality effects related to in-bay construction, but these impacts would remain less than significant through the implementation of regulatory requirements. Because this alternative would use the City's combined sewer system, this alternative would not require the construction of a new stormwater outfall as could be constructed under wastewater and stormwater management Options 2 and 3 of the Proposed Project, therefore there would be less in-bay construction under this alternative. Because development would be less under this alternative, there would be less of a potential for littering, and water quality impacts related to littering would be less than for the Proposed Project.

This alternative includes construction of a four-foot-high berm along the waterfront portion of the project site that would raise the grade along the waterfront to an elevation of 15.4 feet NAVD88 (104 feet project datum), which is approximately the same elevation as the projected 100-year flood elevation with 66 inches of sea level rise. This berm would have a slope of 3:1, and would not substantially alter the patterns of flood flows at the project site or vicinity, and would protect the interior of the project site from future flooding as a result of sea level rise and from flooding due to a tsunami. Shoreline protection improvements, including placing riprap along the water's edge, would be similar under this alternative to those under the Proposed Project. Further, the stormwater drainage system installed under this alternative would be sized to adequately convey stormwater flows in accordance with San Francisco's subdivision regulations and the 2010 Pier 70 Master Plan Alternative would not exacerbate future flooding conditions.

Similar to the Proposed Project, which would have less-than-significant hydrology and water quality impacts with mitigation, as described in Section 4.O, Hydrology and Water Quality, this alternative, with mitigation, would not violate any water quality standards or waste discharge requirements, would not substantially deplete groundwater supplies or interfere substantially with

groundwater recharge, would not substantially alter the existing drainage pattern of the site or area, would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, would not place within a 100-year flood hazard area housing or structures that would impede or redirect flood flows, and would not expose people or structures to a significant risks involving flooding, inundation by seiche, tsunami, or mudflow. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to hydrology and water quality.

HAZARDS AND HAZARDOUS MATERIALS

The gross square footage of development under the 2010 Pier 70 Master Plan Alternative is approximately 50 percent less than under the Proposed Project, and the development footprint is also smaller than the Proposed Project because the 3.6-acre Hoedown Yard on PG&E property would not be developed. Building 19 would be retained under this alternative, resulting in fewer buildings being demolished. Less of the area surrounding the Irish Hill remnant would be developed. Therefore, this alternative would have lesser impacts relative to the Proposed Project related to the use of hazardous materials during construction, the potential to encounter hazardous building materials, the potential to encounter PCBs are a result of transformer removal, the potential to encounter hazardous materials in the soil and groundwater during construction, and the emissions of DPM and dust containing naturally-occurring asbestos or metals within ¼ -mile of a school. Assuming implementation of Mitigation Measures M-HZ-2a: Conduct Transformer Survey and Remove PCB Transformers, M-HZ-2b: Conduct Sampling and Cleanup if Stained Building Materials Are Observed, M-HZ-2c: Conduct Soil Sampling if Stained Soil is Observed, M-HZ- 3a: Implement Construction-Related Measures of the Pier 70 RMP; M-HZ-3b: Implement Well Protection Requirements of the Pier 70 RMP; and M-HZ-5: Delay Development on Proposed Parcel H2 Until Remediation of the PG&E Responsibility Area is Complete, all of these impacts would be less than significant for the 2010 Pier 70 Master Plan Alternative, as for the Proposed Project.

Similar to the Proposed Project, existing and future occupants of the project site would be protected from exposure to hazardous materials in the soil and groundwater through implementation of Mitigation Measure M-HZ-6: Additional Risk Evaluations and Vapor Control Measures for Residential Land Uses. There would be less disturbance of Franciscan Complex bedrock containing naturally occurring asbestos and metals; however, implementation of Mitigation Measures M-HZ-8a: Prevent Contact with Serpentinite Bedrock and Fill Materials in Irish Hill Playground, and M-HZ-8b: Restrictions on the use of Irish Hill Playground, would still

be required to ensure that impacts associated with exposure to naturally-occurring asbestos and metals would be less than significant.

There would fewer new site uses under the 2010 Pier 70 Master Plan Alternative, therefore less hazardous materials would likely be used during operation and there would be less of a fire risk. The changes in the street network would be the same as the Proposed Project and there would be less operational traffic, therefore this alternative would have less of a potential impact on interference with emergency response.

Like the Proposed Project which would have less-than-significant hazards and hazardous materials impacts with mitigation as described in Section 4.P, Hazards and Hazardous Materials, this alternative, with mitigation, would not create a significant hazard through handling of hazardous materials, would not be located on a site which is included on a list of hazardous materials sites, would not be located within an airport land use plan or within two miles of a public airport or in the vicinity of a private airstrip, would not interfere with an adopted emergency response plan or emergency evacuation plan, and would not expose people or structures to a significant risk of loss, injury or death involving fires. As such, the 2010 Pier 70 Master Plan Alternative would have less-than-significant project-level impacts with mitigation, and would not make a considerable contribution to a significant cumulative impact related to hazards and hazardous materials.

MINERAL AND ENERGY RESOURCES

There are no known mineral resources within the project site. Similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative would have no impact on a mineral resource and would not contribute to a significant cumulative impact on a mineral resource.

Like the Proposed Project, which would have a less-than-significant impact on energy resources as described in Section 4.Q, Mineral and Energy Resources, the 2010 Pier 70 Master Plan Alternative would also not include activities which would result in the use of wasteful or large amounts of fuel, water or energy. Thus, this alternative would have a less-than-significant impact on energy resources and would not contribute considerably to any cumulative impact related to energy resources.

AGRICULTURAL AND FOREST RESOURCES

Similar to the Proposed Project, the 2010 Pier 70 Master Plan Alternative would not convert farmland, conflict with agricultural or forest land zoning or a Williamson Act contract, nor result in a loss or conversion of forest land or farmland. The potential impacts related to agricultural and forest resources under the 2010 Pier 70 Master Plan Alternative would be the same as those

for the Proposed Project. Therefore, as with the Proposed Project, there would be no impacts related to agricultural and forest resources under the 2010 Pier 70 Master Plan Alternative.

E. ABILITY OF THE ALTERNATIVES TO MEET PROJECT SPONSORS' OBJECTIVES

The No Project Alternative is included, as required by CEQA Guidelines Section 15126.6(e), even though it would not meet the basic project objectives. The Code Compliant Alternative and the 2010 Pier 70 Master Plan Alternative are potentially feasible options that would likely meet most but not all of the Proposed Project objectives. The ability of each alternative to meet the objectives of the Proposed Project is presented in Table 7.16: Ability of Alternatives to Meet Project Objectives.

Table 7.16: Ability of Alternatives to Meet Project Objectives

Project Sponsors' Objectives	Proposed Project	No Project	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Create a unique San Francisco neighborhood within an industrial historic district that includes new, activated waterfront open spaces with the amenities and services necessary to support a diverse, thriving community of residents and workers, while mitigating land use conflicts with ongoing ship repair at Pier 70.	Yes	No	Partially. The alternative would retain and reuse a former industrial complex that would continue to be a part of an historic district. However, the alternative would have significantly fewer waterfront open spaces, amenities, and services. Overall density of residential and commercial office uses would also be substantially reduced.	Partially. The alternative would retain and reuse a former industrial complex that would continue to be a part of an historic district. However, the alternative would have fewer amenities and services. Overall density of residential uses would be substantially reduced, eliminating the mixed-use nature of the project.
Implement the open space, housing, affordability, historic rehabilitation, artist community preservation, commercial, waterfront height limit and urban design policies endorsed by the voters in Proposition F (November 2014) for the 28-Acre Site.	Yes	No	Partially. The alternative would have a reduced amount of open space and housing as well as reduced housing affordability levels. Alternative would not preserve the existing artist community. Alternative would still include historic rehabilitation and commercial uses.	Partially. The alternative would have a reduced amount of open space and would greatly reduce the amount of housing as well as reduced housing affordability levels. Alternative would still include historic rehabilitation and commercial uses.

Table 7.16 Continued

Project Sponsors' Objectives	Proposed Project	No Project	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Provide dense, mixed-income housing that includes both ownership and rental opportunities to attract a diversity of household types in order to help San Francisco meet its fair share of the regional housing needs.	Yes	No	Partially. The alternative would provide both fewer housing units and affordable housing units. It would contribute fewer market-rate and affordable units toward meeting Francisco's fair share of the regional housing needs.	Partially. The alternative would provide only one parcel for housing, with only the standard level of affordable housing units.
Provide a model of 21st century sustainable urban development by implementing the *Pier 70 Risk Management Plan* approved by the San Francisco Bay Regional Water Quality Control Board, encouraging energy and water conservation systems, and reducing vehicle usage, emissions, and vehicle miles traveled to reduce carbon footprint impacts of new development, consistent with the Port's *Climate Action Plan.*	Yes	No	Partially. The alternative would comply with the *Pier 70 Risk Management Plan*. However, the alternative would not include sustainability features over and above those currently required by the Planning and Building codes.	Yes. The alternative would comply with the *Pier 70 Risk Management Plan*. It would also encourage efficient energy and water conservation systems as well as reduction of vehicle usage and emissions, consistent with the Port's *Climate Action Plan*.
Provide access to San Francisco Bay where it has been historically precluded by opening the eastern shore of the site to the public with a major new waterfront park, extending the Bay Trail and establishing the Blue Greenway, and using design features to create a pedestrian- and bicycle-friendly environment.	Yes	No	Yes. The alternative would provide access to San Francisco Bay, build a waterfront park, extend the Bay Trail and Blue Greenway, and would be pedestrian and bicycle friendly.	Yes. The alternative would provide access to San Francisco Bay, build a waterfront park, extend the Bay Trail and Blue Greenway, and would be pedestrian and bicycle friendly.
Rehabilitate three contributing historic resources within the Union Iron Works Historic District to accommodate new uses consistent with the Secretary of Interior's Standards for Treatment of Historic Properties, and design and build new infrastructure, public realm areas, parks and buildings consistent with the Infill	Yes	No	Yes. The alternative would rehabilitate contributing resources to the Secretary of the Interior's Standards. It would build new public realm areas and new infrastructure and would be consistent with the Infill Development Design Criteria within the Port's *Pier 70 Preferred Master Plan.*	Yes. The alternative would rehabilitate contributing resources to the Secretary of the Interior's Standards. It would build new public realm areas and new infrastructure and would be consistent with the Infill Development Design Criteria within the Port's *Pier 70 Preferred Master Plan*.

Table 7.16 Continued

Project Sponsors' Objectives	Proposed Project	No Project	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
Development Design Criteria within the Port's *Pier 70 Preferred Master* Plan and support the continued integrity of the Union Iron Works Historic District.				
Create business and employment opportunities for local workers and businesses during the design, construction, and operation phases of the Proposed Project.	Yes	No	Yes, although the alternative has a significantly reduced commercial and retail square footage, and therefore would generate fewer employment opportunities during the design, construction and operation phases.	Yes. The alternative would have sufficient commercial and retail square footage to generate business and employment opportunities during the design, construction and operation phases.
Elevate and reinforce site infrastructure and building parcels to allow the new Pier 70 neighborhood to be resilient to projected levels of sea level rise and any major seismic event, as well as incorporate financing strategies that enable the project and the Port's Bay shoreline to adapt to future, increased levels of sea level rise.	Yes	No	Partially. The alternative would include construction of an engineered berm to protect the shoreline against projected levels of sea level rise. However, the alternative would not elevate building parcels, nor would it include a financing strategy to enable the project to adapt to future, increased levels of sea level rise.	Yes. The alternative would include reinforcement of site infrastructure to protect against future sea level rise and seismic events, as well as incorporate financing strategies to fund future improvements.
Along with the Historic Core and Crane Cove Park, serve as a catalyst project for Pier 70 to support the Port's site-wide goals established in the *Pier 70 Preferred Master Plan*, including new infrastructure, streets and utilities, and new revenue to fund other Pier 70 improvements.	Yes	No	Partially. While the alternative would include construction of some new infrastructure, streets, and utilities at the project site, the catalytic effect of the alternative on the larger Pier 70 area would be significantly diminished, as would revenue generation to fund other Pier 70 improvements, due to greatly reduced density.	Yes. The alternative would catalyze the Port's site-wide goals as established in the *Pier 70 Preferred Master Plan*.
Construct a high-quality, public-private development project that can attract sources of public investment, equity, and debt financing sufficient to fund the Proposed Project's site and infrastructure costs, fund ongoing maintenance	Yes	No	No. At the given density, taking into account the level of infrastructure necessary to facilitate development, development under the alternative would not be able to attract sources of equity and debt financing	Partially. While the alternative would likely include development able to fund ongoing maintenance and operation costs, it may not be able to produce a market rate return on investment that meets the requirements of AB 418 and

Table 7.16 Continued

Project Sponsors' Objectives	Proposed Project	No Project	Code Compliant Alternative	2010 Pier 70 Master Plan Alternative
and operation costs, and produce a market rate return investment that meets the requirement of Assembly Bill 418 (2011) and allows the Port to further its Public Trust mandate and mission.			sufficient to fund the project's site and infrastructure costs, would not be able to fund ongoing maintenance and operation costs, and would not produce a market rate return on investment that meets the requirements of AB 418.	therefore would not attract cost-efficient sources of equity and debt financing sufficient to fund the project's site and infrastructure construction costs.
Through exercising of the City's option with PG&E to purchase the Hoedown Yard, provide funds for the City's HOPE VI rebuild projects in accordance with Board Resolution No. 54-14, such as the Potrero Terrace and Potrero Annex HOPE VI.	Yes	No	No. The alternative does not include future development at the Hoedown Yard.	No. The alternative does not include future development at the Hoedown Yard.

F. ALTERNATIVES CONSIDERED AND REJECTED

Section 15126.6(c) of the CEQA Guidelines provides that an EIR should "identify any alternatives that were considered by the lead agency but rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." The screening process for identifying viable EIR alternatives included consideration of the following criteria: ability to meet the project objectives; potential ability to substantially lessen or avoid environmental effects associated with the Proposed Project; and potential feasibility. The discussion below provides the reasons for eliminating these alternatives from detailed consideration in the EIR.

Maritime Use Alternative

The Maritime Use Alternative would contain only maritime; industrial; production, distribution and repair (PDR); and parking uses throughout the entirety of the project site, consistent with existing zoning and height limits. This alternative would be more consistent with the current and past uses at the site. The resulting project would have a significantly lower intensity, which would reduce project trips and associated noise and air quality impacts. It would also eliminate residential uses at both the 28-Acre Site and Illinois Parcels, which would address potential transportation, noise and vibration, and air quality impacts. However, the maritime or industrial

uses could themselves produce greater noise and/or air quality impacts as compared to the Proposed Project.

This alternative was ultimately not selected as it does not achieve a variety of the project sponsors' basic objectives. The Maritime Use Alternative would significantly modify the Proposed Project to allow only maritime, industrial, PDR, and parking uses. The overall intensity would be significantly less than the Proposed Project. The Maritime Use Alternative would not fully meet the project objectives of providing a new, activated waterfront open space and providing access to San Francisco Bay where it has historically been precluded, by opening the eastern shore of the site to the public with a significant new waterfront park, and creating a pedestrian- and bicycle-friendly environment. This alternative would result in no new affordable housing. Additionally, the alternative would not attract sources of equity and debt financing sufficient to fund the alternative's site and infrastructure construction costs or fund ongoing maintenance and operation costs, and would not achieve a market-rate return on investment that meets the requirements of Assembly Bill No. 418 (2011).[8]

No Hoedown Yard Alternative

The No Hoedown Yard Alternative would modify the Proposed Project to eliminate all future development at or improvement of the approximately 3.6-acre Hoedown Yard parcel. This condition would occur if PG&E were unable to find a suitable area to relocate the utilities operations that currently occur at the Hoedown Yard. This alternative would result in a total open space area of 6.7 acres at the project site, a 2.3 acre reduction from the Proposed Project. The No Hoedown Yard Alternative would also result in a reduced intensity of development. The No Hoedown Yard Alternative would result in reduced excavation at the Hoedown Yard parcel. Except for these modifications, the No Hoedown Yard Alternative would include components similar to the Proposed Project.

The No Hoedown Yard Alternative would not require the approval of the California Public Utilities Commission of PG&E's sale of Hoedown Yard parcel. Otherwise, all of the same approval actions as those listed for the Proposed Project in Section 2.G of this EIR.

This alternative would meet most, but not all, of the Project Sponsors' objectives. However, this EIR analyzes as an alternative the 2010 Pier 70 Master Plan Alternative, which includes approximately 32 acres, and excludes all land associated with the Hoedown Yard. Accordingly, the No Hoedown Yard Alternative was ultimately not selected for further consideration because

[8] California State Assembly Bill No. 418: Tidelands and submerged lands: City and County of San Francisco: Pier 70. Available online at http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120AB418. Accessed November 3, 2016.

the 2010 Pier 70 Master Plan Alternative similarly excluded the Hoedown Yard, and therefore analysis of this alternative would be redundant. Additionally, this alternative would not substantially reduce environmental impacts as compared to the Proposed Project.

Noise Compatibility Alternative

The Noise Compatibility Alternative would be similar to the Proposed Project but would allow only commercial-office and RALI uses on the Illinois Parcels, in order to to prevent exposure of future sensitive receptors (that would locate on Illinois Street within the project site) to significant noise impacts. This alternative was also intended to address comments submitted on behalf of the American Industrial Center during the Notice of Preparation public comment period. Except for the modification in allowable uses, the Noise Compatibility Alternative would include components similar to the Proposed Project and would meet most of the project sponsor's objectives. Mitigation Measure M-NO-6: Design of Future Noise-Sensitive Uses, in Section 4.F, Noise and Vibration on pp. 4.F.70-4.F.71, would require that a noise study be conducted by a qualified acoustician who shall determine the need to incorporate noise attenuation measures into the building design. Under the Proposed Project, Mitigation Measure M-NO-6 would reduce the potentially significant noise impact on proposed residential sensitive receptors in the Illinois Parcels to a less-than-significant level. Because no significant and unavoidable impact on proposed residential sensitive receptors would result under the Proposed Project, the identification and evaluation of a Noise Compatibility Alternative is not required under CEQA.

G. ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines Section 15126.6(e)(2) requires identification of an environmentally superior alternative. If the No Project Alternative is environmentally superior, CEQA requires selection of the "environmentally superior alternative other than the No Project Alternative" from among the Proposed Project and the alternatives evaluated. The No Project Alternative is considered the overall environmentally superior alternative because the impacts associated with implementation of the Proposed Project would not occur under the No Project Alternative. However, the No Project Alternative would not meet any of the project objectives.

To identify the environmentally superior alternative in accordance with the CEQA Guidelines, a comparison of the impacts related to the alternatives is presented in Table 7.1 on pp. 7.3-7.6. Thus, the Code Compliant Alternative is the environmentally superior alternative. Due to the substantially lower number of residential units and the decrease in the amount of commercial and RALI space to be constructed and occupied under the Code Compliant Alternative, this alternative would lessen (but not avoid) most of the significant adverse impacts identified for the Proposed Project related to the topics of transportation, noise and vibration, and air quality, and would avoid a significant impact identified for the Proposed Project related to cumulative noise.

The Code Compliant Alternative would also lessen impacts of the Proposed Project that were found to be less than significant, or less than significant with mitigation, related to the topics of land use, population and housing, cultural resources (archeological), cultural resources (historic architectural), greenhouse gas emissions, wind and shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, and mineral and energy resources.

As shown in Table 7.16 on pp. 7.92-7.95, the Code Compliant Alternative would partially meet the project sponsor's objectives. Like the Proposed Project it would retain, rehabilitate, and reuse a former industrial complex that would continue to be a part of an historic district. It would provide public open spaces and waterfront access, commercial and retail space, and would contribute market-rate and affordable units toward meeting San Francisco's regional housing needs. However, it would provide substantially less public open space, market-rate and affordable residential units, and commercial and retail space than the Proposed Project. This alternative would not elevate building parcels, nor would it include a financing strategy to enable the project to adapt to future, increased levels of sea level rise. This alternative would not construct a high-quality, public-private development project that could attract sources of public investment, equity, and debt financing to fund site and infrastructure costs, and ongoing maintenance, and produce a market rate return investment that allows the Port to further its Public Trust mandate and mission.

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APPENDIX A: NOTICE OF PREPARATION

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Notice of Preparation of an Environmental Impact Report and Notice of a Public Scoping Meeting

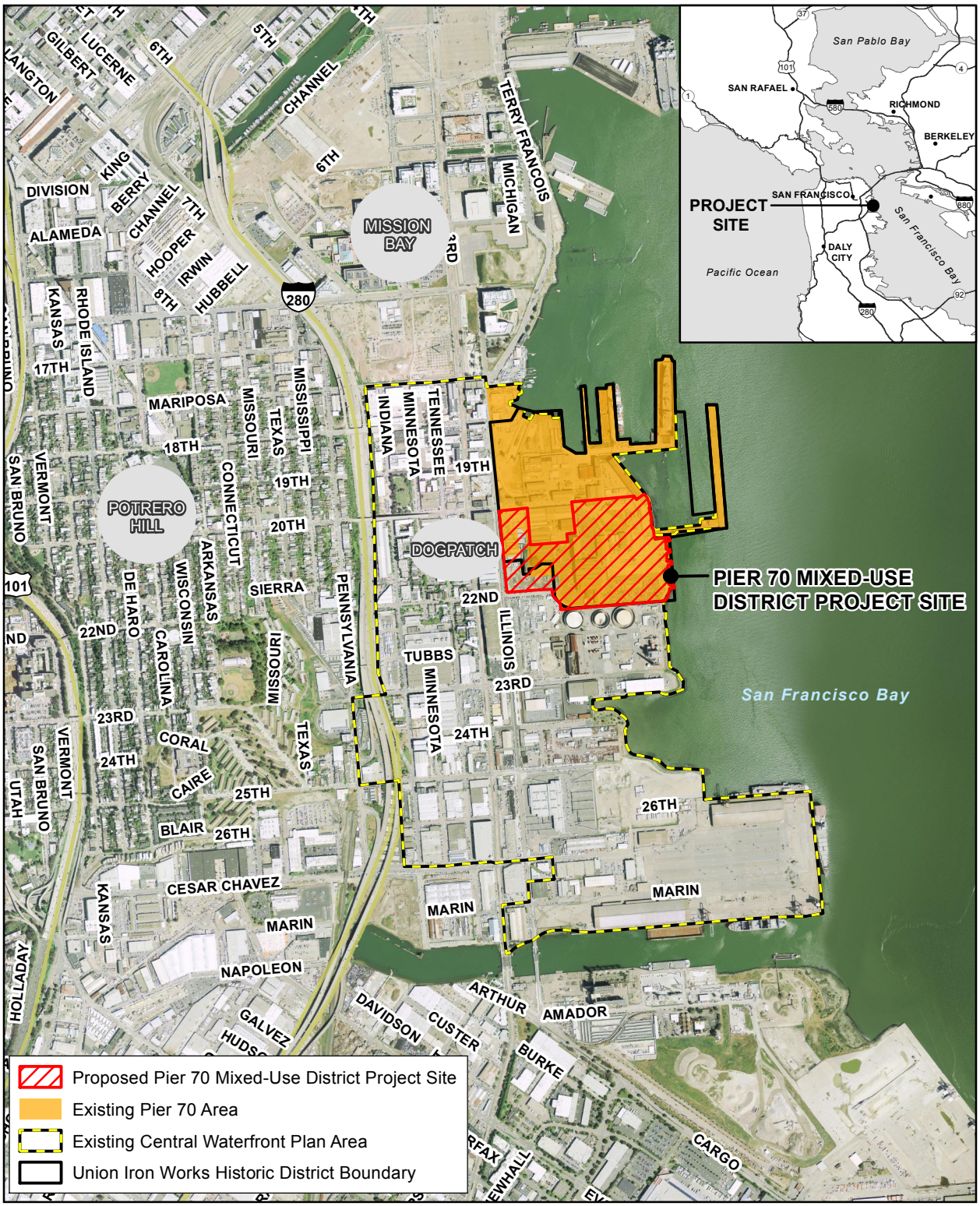
Date:	May 6, 2015
Case No.:	**2014-001272ENV**
Project Title:	**Pier 70 Mixed-Use District Project**
Zoning:	M-2 (Heavy Industrial) and P (Public) 40-X and 65-X Height and Bulk Districts
Block/Lot:	Assessor's Block 4052/Lot 001, Block 4111/ Lot 004 Block 4120/Lot 002, and Block 4110/Lots 001 and 008A
Lot Size:	35 acres (1,524,600 square feet)
Project Sponsor:	Port of San Francisco and Forest City Development California, Inc.
Lead Agency:	San Francisco Planning Department
Staff Contact:	Andrea Contreras – (415) 575-9044 andrea.contreras@sfgov.org

PROJECT OVERVIEW

The proposed Pier 70 Mixed-Use District project site is an approximately 35-acre area bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. (See Figure 1: Project Location.) The project site is south of Mission Bay South, east of the Potrero Hill and Dogpatch[1] neighborhoods, and within the northeastern portion of San Francisco's Central Waterfront Plan Area. In addition, the majority of the project site is located within the Pier 70 area (Pier 70), which is owned by the City and County of San Francisco through the Port of San Francisco (Port).

Two development areas constitute the project site. The "28-Acre Site" is an approximately 28-acre site located between 20th Street, Michigan Street, 22nd Street, and San Francisco Bay that includes Assessor's Block 4052/Lot 001 and Block 4111/Lot 004. The "Illinois Parcels" form an approximately 7-acre site that consists of an approximately 3.4-acre Port-owned parcel, called the 20th/Illinois Parcel, along Illinois Street at 20th Street (Assessor's Block 4110/Lot 001) and an approximately 3.6-acre parcel, called the Hoedown Yard, at Illinois and 22nd streets (Assessor's Block 4120/Lot 002 and Block 4110/Lot 008A),

[1] The Dogpatch neighborhood is bounded by Mariposa Street to the north, I-280 to the west, Cesar Chavez Street to the south, and Illinois Street to the east.



Source: Turnstone Consulting/SWCA

Pier 70 Mixed-Use District Project

FIGURE 1: PROJECT LOCATION

which is owned by PG&E[2]; the Hoedown Yard includes a 0.2-acre portion of street right-of-way that bisects the site[3], and is owned by the City. The Port intends to rehabilitate or redevelop a portion of Pier 70 and has selected Forest City Development California, Inc. (Forest City) to act as master developer, to initiate rezoning and development of design standards and controls for a multi-phased, mixed-use development on a portion of Pier 70.[4] As envisioned, the proposed Pier 70 Mixed-Use District Project (Proposed Project) would include market-rate and affordable residential uses, commercial-office, retail-light industrial-arts use, parking, infrastructure development, including street improvements, and public open space. The project sponsors describe the "retail-light industrial-arts" use to include neighborhood retail, arts activity, eating and drinking places, production distribution and repair, light manufacturing, and entertainment establishments. Both the Port and Forest City are project sponsors for the Proposed Project.

The Proposed Project would include amendments to the General Plan and Planning Code, adding a new Pier 70 Special Use District (SUD), which would establish land use controls for the project site, and incorporating the design standards and guidelines in the proposed *Pier 70 Design for Development* document.[5] The Zoning Maps would be amended to show changes from the current zoning (M-2 [Heavy Industrial] and P [Public]) to the proposed SUD zoning. The Planning Code text amendments would also modify the existing height limits on the eastern portion of the Hoedown Yard from 40 feet to 65 feet. Heights limits on the 28-Acre Site would be increased to 90 feet, except for a 100-foot-wide portion adjacent to the shoreline which would remain at 40 feet, as authorized by Proposition F (November 2014).

As described in detail on p. 16, under the provisions of the proposed SUD, the Proposed Project would provide a flexible land use program, under which certain parcels could be developed for primarily commercial-office or residential uses. In addition, two parcels on the project site that would be designated for district structured parking could be developed with either residential or commercial-office uses depending on future market demand and future transportation network changes. As further described on pp. 17-20, for the 28-Acre Site, up to a maximum of approximately 3,449,050 gross square feet (GSF)

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[2] Under an option agreement between PG&E and the Port, the City and County of San Francisco has an option to purchase the Hoedown Yard, and PG&E has consented to include the Hoedown Yard in the project sponsors' rezoning efforts; however, the City will not exercise its option to purchase the Hoedown Yard, and development of this parcel may not proceed, unless PG&E locates a suitable relocation site for the current utility operations at the Hoedown Yard. The environmental analysis assumes that the City will exercise its option with PG&E, and will subsequently purchase the Hoedown Yard. This is reflected in the letter sent by Kendrick Li, Supervisor Land Acquisition Development, PG&E, to Brad Benson, Port of San Francisco, regarding the Hoedown Yard, June 6, 2014. A copy of this letter is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2014.001272E.

[3] The 0.2-acre Michigan Street right-of-way is a recorded easement; however, no physical roadway exists.

[4] The Port and Forest City entered into an Exclusive Negotiating Agreement in July 2011 by Resolution No. 11-49. The Port Commission and the San Francisco Board of Supervisors both endorsed a Term Sheet outlining features of the Proposed Project in June 2013 by Resolution No. 201-13.

[5] A proposed Design for Development document, which is included as part of the Proposed Project, will set forth the underlying vision and principles for development of the project site, and establish controls, standards and design guidelines to implement the intended vision and principles.

of construction in new buildings and improvements to existing structures (excluding basement-level square footage allocated to accessory and district parking) could be constructed. The existing height limit of 40 feet would be rezoned under the proposed SUD, and new buildings would range in height from 50 to 90 feet. The Illinois Parcels would include up to a maximum of approximately about 801,400 GSF in new buildings; these new buildings would not exceed a height of 65 feet, which is the existing height limit along Illinois Street on both the Port-owned and a majority of the PG&E-owned portions of the Illinois Parcels. The eastern segment of the PG&E-owned portion of the Hoedown Yard would be rezoned from 40 feet to 65 feet under the proposed SUD.

The project site contains 12 of the 54 contributing historic architectural resources and one non-contributing structure of the National Register of Historic Places-listed Union Iron Works Historic District that illustrate decades of Pier 70's use as an iron and steel manufacturing and shipbuilding area. The Proposed Project includes rehabilitation and adaptive reuse of three contributing resources (Buildings 2, 12, and 21) in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Also, the majority of the existing portion of Irish Hill, a contributing resource, would be retained. The eight remaining contributing structures on the site, Buildings 11, 15, 16, 19, 25, 32, 66, and 117[6], would be demolished as part of the Proposed Project. In addition, the single non-contributing resource on the site, Slipways 5 through 8, currently covered by fill and asphalt, would be partially demolished.

The Proposed Project also includes construction of transportation and circulation improvements, new and upgraded utilities and infrastructure, geotechnical and shoreline improvements, and nine acres of publicly-owned open space.

PROJECT LOCATION AND SITE CHARACTERISTICS

Project Site Vicinity

The 35-acre project site is located along San Francisco's Central Waterfront, described in more detail below on p. 10, just south of Mission Bay South and east of the Potrero Hill and Dogpatch neighborhoods. Highways 101 and 280, the Potrero Hill neighborhood, and the Dogpatch neighborhood are in the western vicinity of the project. The American Industrial Center, a large multi-tenant commercial building, is located across Illinois Street, west of the Illinois Parcels. To the north of the project site are the BAE Systems shipyards, the 20th Street Historic Core of the Union Iron Works Historic District (Historic Core),[7] the future Crane Cove Park (construction to begin in 2016), and the Mission Bay South redevelopment area. To the south of the project site are PG&E's Potrero Substation (a functioning

[6] The Port may decide to demolish Building 117 prior to approval of the Proposed Project. Any such approval of demolition of Building 117 would undergo appropriate environmental review, as required by CEQA.

[7] The 20th Street Historic Core, which is to the north of the project site, is an approximately 7.6-acre portion of the Union Iron Works Historic District and contains 270,000 gross square feet (GSF) of largely vacant industrial and office space.

high-voltage transmission substation serving San Francisco), the decommissioned Potrero Power Plant, and the TransBay Cable converter station, which connects the Pittsburg-San Francisco 400 megawatt direct-current, underwater electric transmission cable to the City's electricity distribution grid by way of the Potrero Substation.

Nearby transportation infrastructure includes Third Street, a major arterial[8] located about 300 feet west of the project site; the Caltrain right-of-way and 22nd Street station, located approximately 0.3 mile to the west; and the north-south-running Highways 101 and 280, also located about 0.5 mile and 0.3 mile, respectively, west of the project site. Cesar Chavez Street runs east-west about 0.5 mile to the south of the project site and connects to Highway 101. Muni's Third Street light rail has two station stops between 500 to 1,000 feet from the project site, one at Third and 20th streets and the other at Third and 23rd streets. The project site is approximately 0.5 mile from stops for the Muni 22 Fillmore and 48 Quintara/24th Street bus lines. Major bikeways near the project site are Route 5 (Illinois Street), a dedicated north-south running bikeway along the waterfront (including The Embarcadero to Bayshore Boulevard); Route 40 (16th and Illinois Streets), a dedicated east-west running bikelane; and Route 7 (Indiana Street), a north-south running bike route through the Dogpatch neighborhood.

Project Site Development Background

Pier 70 is owned by the Port of San Francisco and encompasses approximately 69 acres of historic shipyard property along San Francisco's Central Waterfront. Most of Pier 70 (66 of the total 69 acres) is listed on the National Register of Historic Places as the Union Iron Works Historic District, described in more detail below on p. 6. Ship repair and other industrial operations activities are currently conducted on portions of Pier 70.

In 1997, the San Francisco Port Commission identified the preservation of Pier 70's ship repair industry and history as key priorities for their waterfront area plan[9] and, in 2010, developed the *Pier 70 Preferred Master Plan*[10] (Master Plan), which sets forth the Port's Pier 70 vision to "create a vibrant and authentic historic district that re-establishes the historic activity level, activates new waterfront open spaces, creates a center for innovative industries, and integrates ongoing ship repair operations."[11] The Master Plan also provides a framework for Pier 70 that serves to allocate land between parks, ship repair, historic rehabilitation, and new development sites; establish infill design guidelines to protect the integrity of the historic district as new development occurs; and prioritize investment in the most significant historic buildings.

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8 *San Francisco General Plan* Transportation Element, Map 6, Vehicular Street Map.

9 Port of San Francisco, Waterfront Land Use Plan, adopted 1997.

10 Port of San Francisco, *Pier 70 Preferred Master Plan*, April 2010. Available online at http://www.sfport.com/ftp/uploadedfiles/about_us/divisions/planning_development/southern_waterfront/pier70masterplan_intro-overview.pdf, accessed March 18, 2015.

11 Ibid., p. 1.

In furtherance of these goals, the Port intends to rehabilitate or redevelop a portion of Pier 70 and has selected Forest City as the master developer to initiate rezoning and development of design standards and controls for a multi-phased, mixed-use development on the project site.

Proposition F

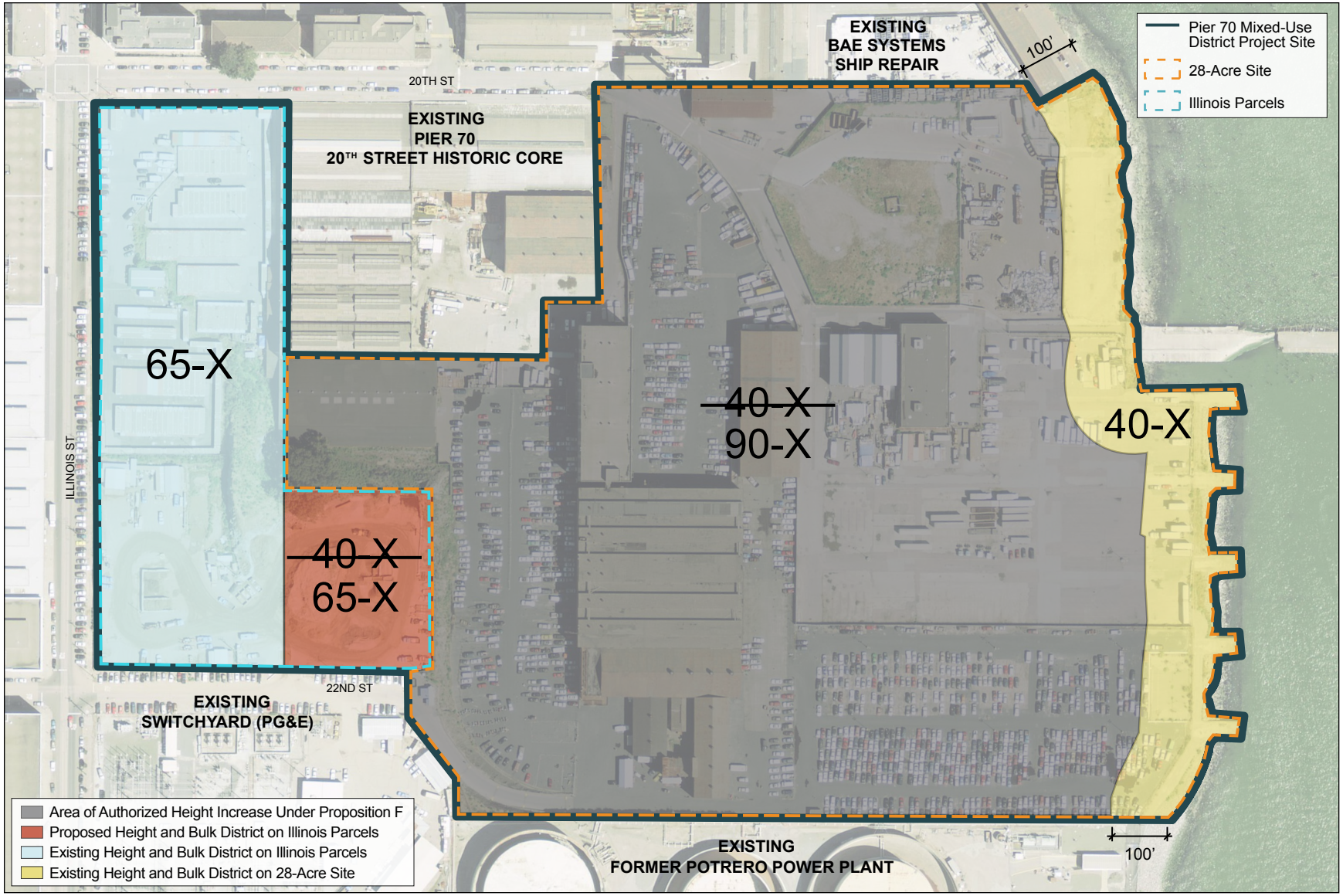
On November 4, 2014, the San Francisco electorate approved Proposition F, a ballot measure that authorized a height increase at the 28-Acre Site from the existing 40 feet to 90 feet, directed that the project proposed on the 28-Acre Site undergo environmental review, and established policies that certain significant public benefits be included as part of the Proposed Project at the 28-Acre Site. (See Figure 2: Existing and Proposed Height and Bulk Districts.) Proposition F complied with the requirement established by Proposition B (June 2014) for San Francisco City voter approval for any proposed height limit increase on Port-owned property that would exceed existing height limits in effect as of January 1, 2014. Proposition F conditioned the effective date of the proposed height increase on completion of an EIR and approval of a development plan for the 28-Acre Site by the Port Commission and Board of Supervisions. Proposition F did not address the Illinois Street Parcels. Proposition B does not apply to the Hoedown Yard, because the property is not owned by the Port of San Francisco.

Union Iron Works Historic District

The majority of the project site is located within the 66-acre Union Iron Works Historic District (the Historic District). Union Iron Works Historic District's nomination report[12] documents the significance of the Union Iron Works (UIW) and Bethlehem Steel at Pier 70 and their role in the nation's maritime history, supporting multiple war efforts, as well as in the evolution of industrial architecture in San Francisco. Pier 70's historic resources are widely recognized as constituting the most intact industrial complex west of the Mississippi that represents the industrialization of the western United States. At Pier 70, UIW built or repaired ships from the Spanish American War in 1898, and ship repair operations continue today.

The Historic District's 54 contributing and non-contributing resources include "buildings, piers, slips, cranes, segments of a railroad network, and landscape elements." Most of the buildings are industrial, and made of "unreinforced brick masonry, concrete, and steel framing, with corrugated iron or steel cladding."[13] The Historic District registration was listed in the National Register of Historic Places in large part because the area "maintains exceptional integrity in terms of location, design, setting, materials,

[12] The Historic District nomination provides a complete account of the history of the site and can be accessed on the Port's website at http://sfport.com/Modules/ShowDocument.aspx?documentID=6608, accessed April 7, 2015.
[13] Ibid., p. 5.



Source: Port of San Francisco, Turnstone Consulting/SWCA

Pier 70 Mixed-Use District Project

FIGURE 2: EXISTING AND PROPOSED HEIGHT AND BULK DISTRICTS

workmanship, feeling, and association."[14] The District is not listed within Article 10 or 11 of the San Francisco Planning Code.[15]

The project site contains 12 of the 54 contributing historic architectural resources and one of the non-contributing structures in the Historic District. (See Figure 3: Existing Site Plan.) While not included in the Historic District, the Hoedown Yard has also been used for industrial purposes since the 1880s. Identifiable historical uses appear to have been limited to the storage of fuel oil in above-ground storage tanks (30,000-40,000 barrel capacity) for adjacent industrial activities. PG&E acquired the site over time from various companies, including Union Iron Works and Bethlehem Steel.

Project Site Land Use Restrictions

Existing Public Trust Lands

Portions of the 28-Acre Site are subject to the common law public trust for commerce, navigation, and fisheries and the statutory trust under the Burton Act,[16] as amended (the Public Trust). The Public Trust imposes certain use restrictions on historical tidal and submerged lands along the waterfront to protect the interests of the people of the State of California in commerce, navigation, and fisheries, as well as other public benefits recognized to further trust purposes, such as recreation and environmental preservation.[17] Because residential and general office uses are generally disallowed by the Public Trust, the Port has obtained state legislation (AB 418) that authorizes the State Lands Commission to approve a Public Trust exchange that would free portions of the project site from the Public Trust.[18] Rezoning the project site through the proposed SUD requires approval by the State Lands Commission of a trust exchange agreement meeting the requirements of AB 418, which agreement would lift the Public Trust from designated portions of Pier 70. Certain portions of the Public Trust lands involved in the proposed trust exchange would be within the project site. Areas of the project site within 100 feet of the shoreline are also subject to the permitting jurisdiction of the San Francisco Bay Conservation and Development Commission.

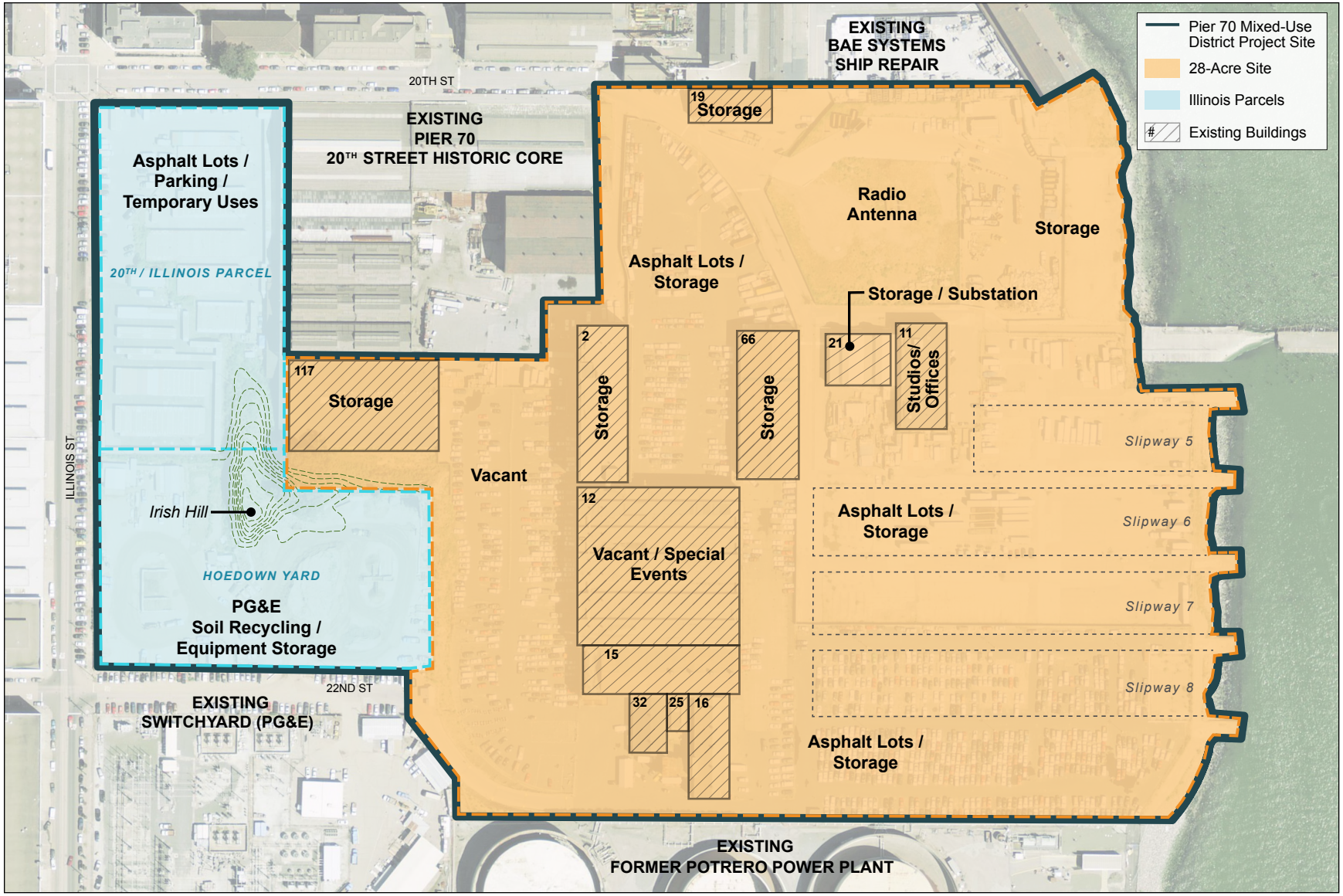
[14] Ibid.

[15] Article 10 of the Planning Code describes Preservation of Historical Architecture and Aesthetic Landmarks, and Article 11 of the Planning Code describes Preservation of Buildings and Districts of Architectural, Historical, and Aesthetic Importance in the C-3 District.

[16] Statutes of 1968, Chapter 1333.

[17] Public Trust Policy, adopted by the State Lands Commission on August 29, 2001. [http://www.slc.ca.gov/About_The_CSLC/Public_Trust/Public_Trust_Policy.pdf]

[18] Assembly Bill 418 (stats. 2011, ch. 447).



Source: Sitelab Studio, Turnstone Consulting/SWCA

0 100 200 400 FT

Pier 70 Mixed-Use District Project

FIGURE 3: EXISTING SITE PLAN

Central Waterfront Plan Area

The Proposed Project comprises the northeastern portion of the Central Waterfront Plan area, as shown on Figure 1: Project Location. The Central Waterfront Plan is one of the four plan areas covered by the *Eastern Neighborhoods Area Plan*, which was adopted in 2009.[19] The Eastern Neighborhoods planning effort addressed neighborhoods that contained much of the City's industrial zoned land and have been in transition to other uses. One of the goals of the Eastern Neighborhoods planning effort was to find a balance between growth of housing and offices in these areas while still reserving areas as production, distribution, and repair facilities.[20]

Existing Zoning and Height and Bulk Districts

As shown on Figure 2: Existing and Proposed Height and Bulk Districts, the 28-Acre Site is zoned M-2 (Heavy Industrial) and located in a 40-X Height and Bulk District. The Illinois Parcels are zoned M-2 and P (Public) and located in a 65-X Height and Bulk District and a 40-X Height and Bulk District. As noted above, the project site was included in the *Eastern Neighborhoods Area Plan* (as part of the *Central Waterfront Area Plan)*, but the uses were not rezoned, pending a Port-led process for Pier 70. Planning Code amendments associated with the *Eastern Neighborhoods Area Plan* increased height limits for the portion of the Illinois Parcels facing Illinois Street from 40 feet to 65 feet; however, height limits for the eastern portion of the Hoedown Yard and the entirety of the 28-Acre Site were not changed under the *Eastern Neighborhoods Area Plan*, and remain at 40 feet.

Project Site Characteristics

The project site currently contains approximately 345,600 GSF of mostly vacant buildings and facilities. Current uses on the site, all of which are temporary, include special events, self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, artists' studios, and office spaces. These uses are described in detail below.

The project site has varying topography, sloping down toward San Francisco Bay, with an approximately 30-foot decrease in elevation at the western extent of the 28-Acre Site. The project site has almost no vegetation, with the exception of a multi-trunk eucalyptus tree and grasses on the approximately 24-foot-tall remnant of Irish Hill, and scattered vegetation in the northeast portion of the 28-Acre Site.

[19] San Francisco Planning Department website, *Eastern Neighborhoods*, available online at www.sf-planning.org/index.aspx?page=1673, accessed April 6, 2015. The other plan areas within the *Eastern Neighborhoods Area Plan* are Potrero (adjacent and west of the Central Waterfront Plan area), Mission (west of Potrero), Showplace Square (adjacent and north of Potrero), and East SOMA (i.e., East South of Market, which is northwest of Mission Bay).

[20] San Francisco Planning Department website, *About the Eastern Neighborhoods*, available online at www.sf-planning.org/index.aspx?page=1677#1, accessed April 6, 2015.

Approximately 98 percent of the 28-Acre Site is covered by impervious surface, and approximately 43 percent of the Illinois Parcels is covered by impervious surface.

28-Acre Site

The existing buildings on the 28-Acre Site are mostly low- to mid-rise structures in deteriorating condition, and a small portion of the remaining 1.4-acre remnant of Irish Hill, further described below under the Illinois Parcels. (See Figure 3: Existing Site Plan.) The Port has entered into interim leases for all of the useable buildings. Current uses of these buildings are as follows:

- Building 2, formerly Warehouse No. 2, a warehouse space, is leased by Paul's Stores for storage.
- Building 11, known as the Noonan Building and previously used as administration and design offices for the World War II shipbuilding yard, is currently leased as artists' studios and office space.
- The Building 12 complex was where ship hull plates were made from templates. The complex is made up of Building 12 (formerly Plate Shop No. 2), Building 15 (former Layout Yard), Building 16 (former Stress Relieving Building), Building 25 (former washroom and lockers), and Building 32 (former Template Warehouse). The Building 12 complex and the paved lot to the west of the Building 12 complex are leased by Forest City from the Port (authorized by the Revocable License Agreement for Special Events) for community, arts and cultural, and special events.
- Building 19 is currently part of the BAE Systems lease premises, where it is used to store sandblasting grit. Under the BAE lease, Building 19 will be removed from the BAE leasehold as part of BAE's shipyard master plan, which is still under development.
- Building 21, an electrical substation and a former Risdon Iron and Locomotive Works and Pacific Rolling Mills Company building, is leased to the SOMArts Cultural Center for storage.
- Building 66, the former Welding Shed, and the paved parking lots located along and to the west of Building 2 are leased to Yellow Cab for taxi cab storage.
- Building 117, a former shipyard training center, is leased by the Delancey Street Foundation for storage.

The Port has also leased certain portions of the land within the project site, including four former slipways, Slipways 5, 6, 7, and 8, on the 28-Acre site, which have been filled and paved. Current uses are as follows:

- East of Building 19 is an asphalt area containing a privately owned radio antenna.
- Paved land in the northeast corner of the project site, the site of a former metal recycling facility, is subleased by Affordable Self Storage.
- West of the Noonan Building, SOMArts and Ernest Rivera lease paved land for storage.
- Affordable Self Storage leases the southeastern corner of the slipways, which includes rows of self-storage lockers. Immediately north of Affordable Self Storage, Boas International leases an area for new automobile storage.

With the exception of a portion of the Affordable Self Storage lease area along the southern border of the project site and the studio/office uses in Building 11, all described leases are intended to terminate upon attainment of entitlements for the Proposed Project.

Illinois Parcels

20th/Illinois Parcel

The 20th/Illinois Parcel, which is owned by the Port and within the greater 69-acre Pier 70 boundary, is a paved area that is currently occupied by asphalt lots for paid parking, construction lay-down, and other temporary uses. A remaining section of the 1.4-acre remnant of Irish Hill straddles both the southeast corner of the 20th/Illinois Parcel and the northeast corner of the Hoedown Yard, further described below.

Hoedown Yard

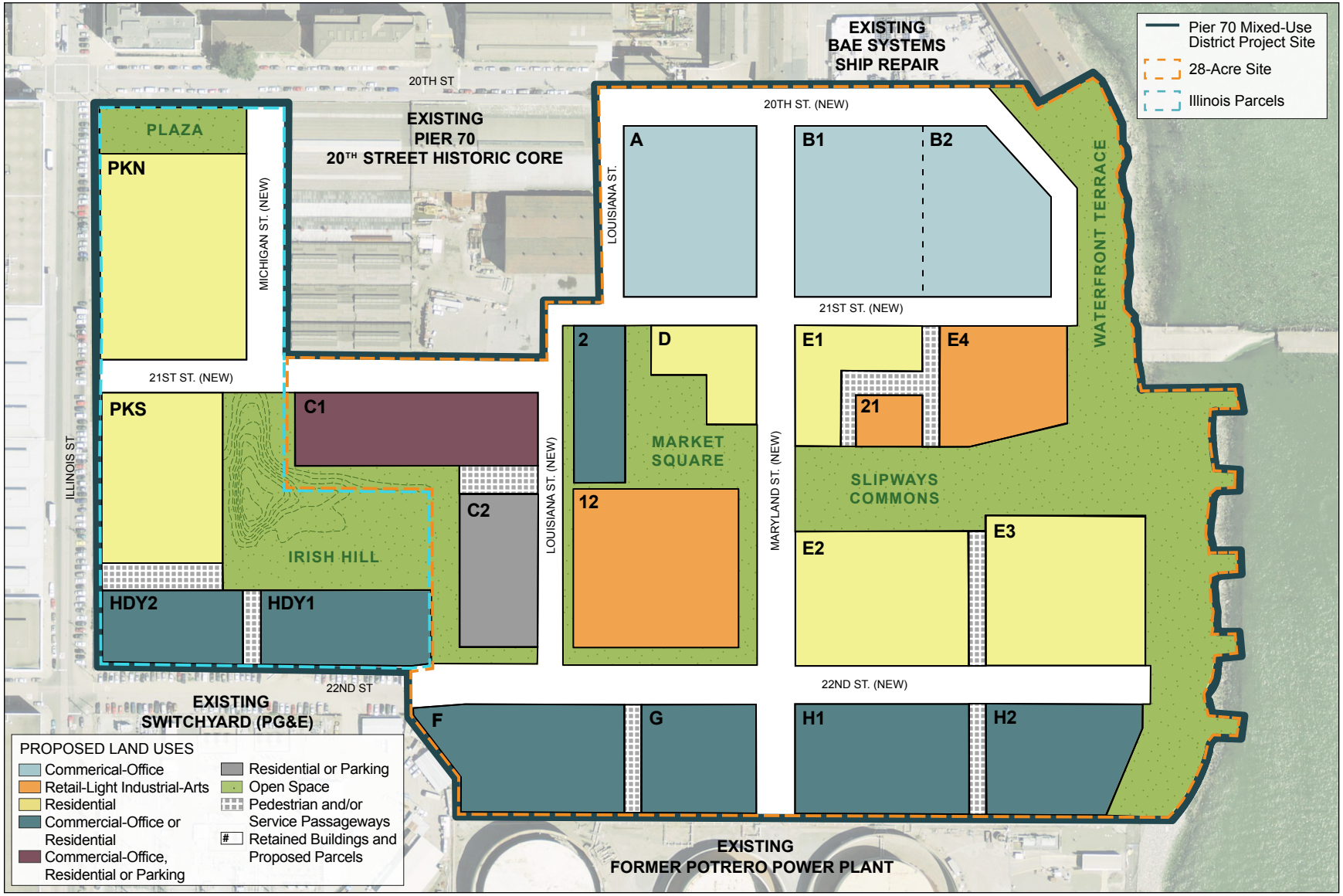
South of the 20th/Illinois Parcel, the PG&E-owned Hoedown Yard is used for soil recycling and for storage of construction equipment. The northeast corner of the Hoedown Yard is occupied by a remaining section of Irish Hill. The Hoedown Yard is outside of the 69-acre Pier 70 boundary, but is included in the project site and proposed SUD.

PROJECT CHARACTERISTICS

Proposed Project Development Characteristics

The Proposed Project would rezone the entire 35-acre project site (including both the 28-Acre Site and the Illinois Street Parcels) and establish development controls for the site through adoption of a proposed SUD. (See Figure 4: Proposed Land Use Plan.) As envisioned, the Proposed Project would include market-rate and affordable residential uses, commercial-office use, retail-light industrial-arts use, parking, infrastructure development, including street improvements, and public open space. The project sponsors propose a flexible land use program under which certain parcels on the project site could be designated for either commercial-office or residential uses. In addition, the proposed SUD would provide that two parcels on the project site would be designated for district structured parking, but could be developed with either residential or commercial uses depending on future market demand and future transportation network changes.

For the 28-Acre Site, up to approximately 3,449,050 GSF of construction in new buildings and improvements to existing structures (excluding square footage allocated to potential accessory and district parking) is proposed. New buildings would range in height from 50 to 90 feet. The Illinois Parcels would include up to approximately 801,400 GSF of construction in new buildings. New buildings on the Illinois Parcels would not exceed a height of 65 feet.



Source: Sitelab Studio, Turnstone Consulting/SWCA

Pier 70 Mixed-Use District Project

FIGURE 4: PROPOSED LAND USE PLAN

Demolition and Renovation

The project site has 12 contributing historic architectural resources and one non-contributing structure, totaling 345,600 GSF, within the designated Union Iron Works National Register Historic District. The Proposed Project includes rehabilitation in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties of approximately 237,800 GSF at Buildings 2, 12, and 21 for reuse. Buildings 2 and 12 would remain in their current locations, and Building 21 would be relocated about 75 feet to the southeast, which is intended to create public frontage along the waterfront park and maintain a visual connection to Buildings 2 and 12. (See Figure 5: Proposed Rehabilitation, Retention and Demolition Plan.) The nine remaining contributing structures and features on the site, Buildings 11, 15, 16, 19, 25, 32, 66, 117[21], and a portion of the remaining section of Irish Hill, and portions of the one non-contributing structure, subterranean portions of Slipways 5 through 8, would be demolished as part of the Proposed Project.

Relocation of Existing Tenants

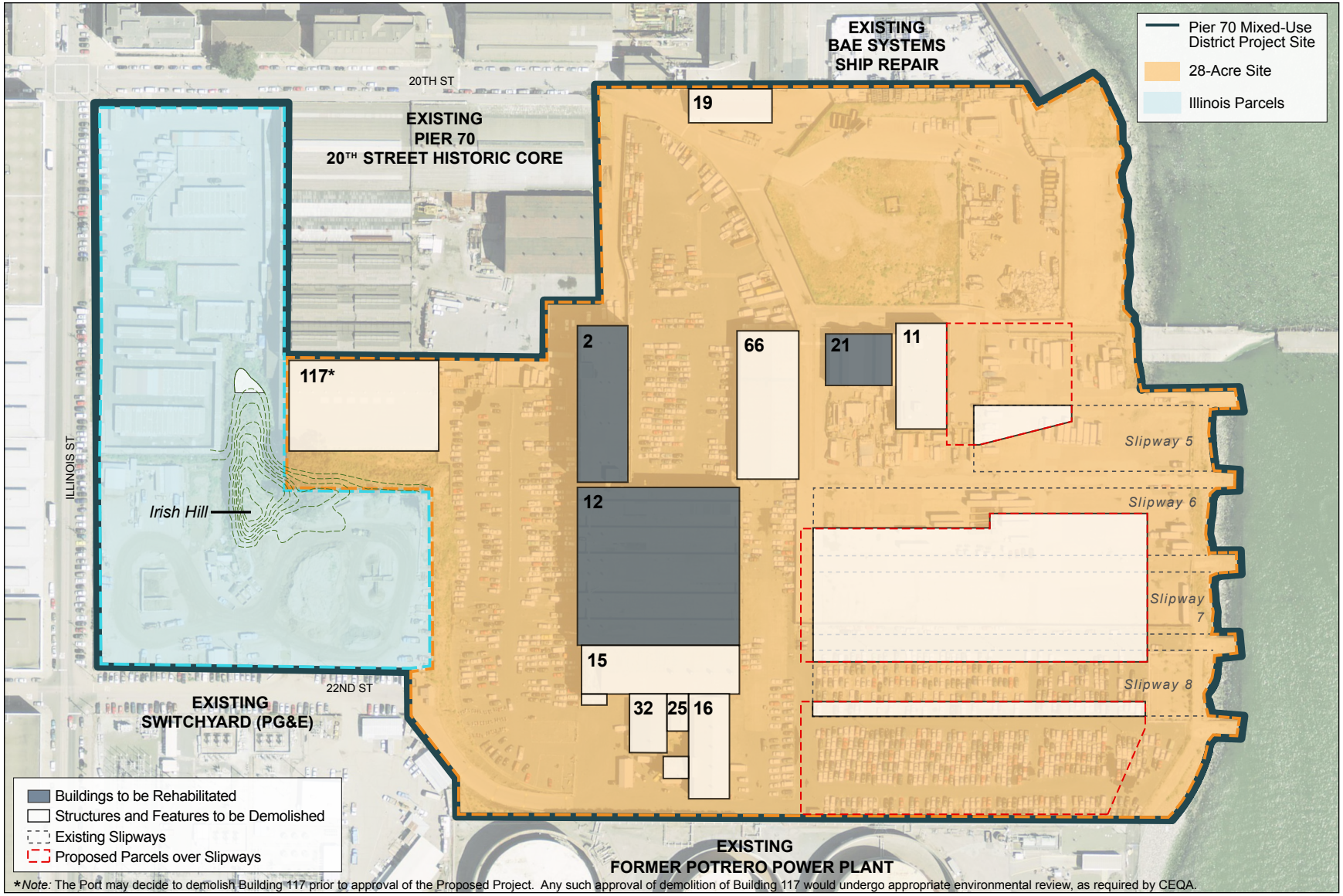
The Port negotiated most of the existing leases on the 28-Acre Site and the 20th/Illinois Parcel after entering into exclusive negotiations with Forest City. All existing leases are short-term leases for interim uses, and all but the tenants in Building 11 and a portion of the Affordable Self Storage lease will terminate by July 31, 2016, in anticipation of the Proposed Project. The Port will develop a plan for tenant relocation to the extent required under the California Relocation Assistance Law (California Gov. Code Section 7260 et seq.), and applicable regulations. The Port will also try to relocate larger-scale tenants to other available, suitable Port property. As part of its proposed Fiscal Year 2015-2016 capital budget, the Port is proposing to improve 17 acres of the Pier 94 Backlands[22] as paved, open industrial land. If constructed in time, the Backlands would be one of the potential locations identified by Port staff for major tenants at Pier 70 when relocation becomes necessary.

In accordance with the Term Sheet[23] between the Port and Forest City, Forest City has offered the tenants of the Noonan Building (most of whom are on month-to-month leases) replacement space at Pier 70 after the Noonan Building is demolished, with rent based on the Port's current parameter rent schedule for the Noonan Building. The tenants of the Noonan Building will be continuously accommodated at Pier 70.

[21] The Port may decide to demolish Building 117 prior to approval of the Proposed Project. Any such approval of demolition of Building 117 would undergo appropriate environmental review, as required by CEQA.

[22] Pier 94 Backlands is a 23-acre unimproved Port-owned site located about one mile to the south of the Pier 70 Mixed-Use District project site.

[23] San Francisco Port Commission, *Term Sheet for Pier 70 Waterfront Site*, June 11, 2013. A copy of this document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2014.001272E.



**Note:* The Port may decide to demolish Building 117 prior to approval of the Proposed Project. Any such approval of demolition of Building 117 would undergo appropriate environmental review, as required by CEQA.

Source: Sitelab Studio, Turnstone Consulting/SWCA

Pier 70 Mixed-Use District Project

FIGURE 5: PROPOSED REHABILITATION, RETENTION AND DEMOLITION PLAN

Flexible Land Use Program

The Proposed Project would amend the Planning Code to include the proposed SUD, and would amend the Zoning Maps to reflect the proposed SUD. The proposed SUD would require compliance with the proposed Design for Development. Under the proposed SUD, the zoning would allow designated parcels to be developed for either residential or commercial office uses to allow for flexibility in the types and amounts of uses developed on the project site. Under the proposed SUD, the flexible land use program would also provide two parcels, located at the corner of Louisiana and the new 21st streets and near the western boundary of the 28-Acre Site, that would be designated for district structured parking facilities. One site could be developed for either residential or commercial-office uses and another site could be developed for residential use depending on future market demand and future transportation network changes.

As discussed above and illustrated in Figure 4, the flexible zoning proposed in the SUD would allow for a mixed-use development on the various planned parcels that responds to market conditions in the project site vicinity. The proposed new zoning in the SUD would permit the following uses on the 28-Acre Site:

- Parcels A, B1 and B2 would be restricted to primarily commercial-office uses, with retail-light industrial-arts use allowed on the ground floor.
- Parcel C1 would be permitted for either commercial-office, residential or parking uses, with retail-light industrial-arts use allowed on the ground floor.
- Parcel C2 would be permitted for either residential or parking uses, with retail-light industrial-arts use allowed on the ground floor.
- Parcels D, E1, E2 and E3 would be restricted to primarily residential use, with retail-light industrial-arts use allowed on the ground floor.
- Parcels F, G, H1 and H2 would be permitted for either commercial-office or residential uses, with retail-light industrial-arts use allowed on the ground floor.
- Building 2 would be permitted for either commercial-office or residential uses.
- Parcel E4 and Buildings 12 and 21 would be restricted to primarily retail-light industrial-arts uses.
- In addition, all parcels except for existing Building 2 would be permitted to include retail-light industrial-arts use on the ground floor.
- In addition, all parcels except for existing Buildings 2, 12, and 21 would be permitted to include parking on the ground floor, and below-grade parking in proposed basement levels.

The flexible zoning proposed in the SUD would permit the following uses on the Illinois Parcels:

- 20th/Illinois Parcels (Parcels PKN and PKS) would be restricted to primarily residential use, with retail-light industrial-arts use and commercial-office uses allowed on the ground floor.
- Hoedown Yard (Parcels HDY1 and HDY2) would be permitted for either commercial-office or residential uses, with retail-light industrial-arts use allowed on the ground floor.

- All development parcels would be permitted to include retail-light industrial-arts use and parking on the ground floor, and below-grade parking in proposed basement levels.

Under the proposed SUD, development would provide a balanced mix of uses to support revitalization of the project site and would reflect market conditions in the project site vicinity. To cover a full range of potential land uses that could be developed under the proposed SUD, the EIR will analyze a maximum residential-use scenario and a maximum commercial-use scenario for the project site, which will bracket specific maximum ranges of uses that could be developed under the proposed SUD as described below.

The Maximum Residential Scenario and the Maximum Commercial Scenario for both the 28-Acre Site and the Illinois Parcels are mutually exclusive: the maximum commercial and maximum residential programs could not both be built. If the Proposed Project were to be built with the maximum amount of commercial space, less space would be developed with residential uses, and conversely, if the maximum number of residential units were constructed, less space would be developed with commercial uses as described below. Depending on the uses developed, the Proposed Project's total GSF would range between a maximum of 4,211,050 GSF, under the Maximum Residential Scenario, to 4,266,350 GSF, under the Maximum Commercial Scenario, excluding square footage associated with accessory and district parking.[24] Total construction on the 28-Acre Site would not exceed a maximum of 3,424,950 GSF, and a maximum of 801,400 GSF on the Illinois Parcels.

Maximum Residential Scenario

28-Acre Site

Development under the Maximum Residential Scenario on the 28-Acre Site would include a maximum of up to 3,424,950 GSF in new and renovated buildings. (See Table 1: Project Summary Table for Maximum Residential Scenario.) Construction under this scenario would provide up to 2,150 residential units (up to approximately 710 studio/one-bedroom units and 1,440 two- or more bedroom units), totaling about 1,870,000 GSF, as well as approximately 1,095,650 GSF of commercial-office space and approximately 459,300 GSF of retail-light industrial-arts use. The overall development envelope described above includes rehabilitation, in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, of 237,800 GSF in Buildings 2, 12, and 21. As noted above, the flexible land use program contemplates two parcels, Parcels C1 and C2, which may be developed for parking, residential or commercial-office use depending on future market demand and future transportation network changes. The project summary table, shown below, assumes that these two parcels are built as residential use, in order to study the maximum GSF of development area on the project site under this Maximum Residential Scenario.

[24] Per the Planning Code, parking and mechanical equipment space do not count toward gross square footage; for the Proposed Project, below-grade levels would have parking and mechanical equipment.

Table 1: Project Summary Table for Maximum Residential Scenario

Uses	Existing Gross Square Footage	Existing Buildings to Be Rehabilitated	28-Acre Site New and Rehabilitated Construction	Illinois Parcels New Construction	Maximum Proposed Project Totals
Residential	0	N/A	1,870,000 GSF (Parcels C1, C2, D, E1, E2, E3, F, G, H1, H2, and Building 2)	760,000 GSF (Parcels PKN, PKS, HDY1, and HDY2)	**2,630,000 GSF**
Residential Units	0	N/A	2,150 units	875 units	**3,025 units**
Commercial-Office	0	N/A	1,095,650 GSF[1] (Parcels A, B1, and B2)	6,600 GSF (Parcel PKN)	**1,102,250 GSF**[1]
Retail-Light Industrial-Arts[2]	0	N/A	459,300 GSF (Parcels A, B1, B2, C1, C2, D, E1, E2, E3, E4, F, G, H1, H2 and Buildings 12 and 21)	34,800 GSF (Parcels PKN, PKS, HDY1, and HDY2)	**494,100 GSF**[1]
Existing Buildings	345,600	237,800 GSF[1]	–	–	**Included above**
Total GSF	***345,600***	***237,800***	***3,424,950 GSF***	***801,400 GSF***	***4,226,350 GSF***[1]
Parking Spaces - Off Street	171	0	2,555	660	**3,215**
Parking Spaces - On Street	152	0	–	–	**285**[3]
Open Space	0	N/A	6.5 acres	2.5 acres	**9 acres**

Notes:
1 The existing 237,800 GSF of retained building space in Buildings 2, 12, and 21 on the 28-Acre Site would be renovated and converted into Commercial-Office, Retail-Light Industrial-Arts, or Residential uses. The Proposed Project's Total GSF reflects this retained and renovated space.
2 Retail-light industrial-arts uses would be on the ground-floor levels of all future buildings on Parcels A, B1, B2, C1, C2, D, E1, E2, E3, F, G, H1, H2, PKN, PKS, HDY1 and HDY2. Parcel E4 and Buildings 12 and 21 would only contain retail-light industrial-arts uses. There would be no retail-light industrial-arts uses in Building 2.
3 The street network planned as part of the Proposed Project would include all public roadways. This total number of on-street public parking spaces provided is an estimate, since this number does not yet account for the loss of potential on-street public parking spaces that may be associated with ADA parking and/or loading requirements (spaces are longer than traditional parking spaces), nor does it account for any requirements associated with turnaround regulations required by the San Francisco Fire Department.

Source: Forest City; Turnstone / SWCA

Illinois Parcels

Development under the Maximum Residential Scenario on the Illinois Parcels would include a maximum of up to 801,400 GSF in newly constructed buildings (see Table 1). Construction under this scenario would provide up to 875 residential units (up to approximately 290 studio/one-bedroom units and 585 two- or more bedroom units) totaling about 760,000 GSF, as well as approximately 6,600 GSF of commercial-office area and approximately 34,800 GSF of retail-light industrial-arts space in new buildings.

Maximum Commercial Scenario

28-Acre Site

Development on the 28-Acre Site under the Maximum Commercial Scenario would include a maximum of up to about 3,449,050 GSF in new and renovated buildings. (See Table 2: Project Summary Table for Maximum Commercial Scenario.) Construction under this scenario would provide up to 1,100 residential units (up to approximately 365 studio/one-bedroom units and 735 two- or more bedroom units) totaling about 957,000 GSF, as well as approximately 2,024,050 GSF of commercial-office area and approximately 468,000 GSF of retail-light industrial-arts uses. The overall development envelope described above includes the rehabilitation, in compliance with the Secretary of the Interior's Standards for Treatment of Historic Properties, of 237,800 GSF in Buildings 2, 12, and 21. As noted above, the flexible land use program contemplates two parcels, Parcels C1 and C2, which may be developed for parking, residential or commercial-office use depending on future market demand and future transportation network changes. The project summary table, shown below, assumes that Parcel C1 is developed as commercial-office use and Parcel C2 is developed as residential use, in order to study the maximum GSF of development area on the project site under this Maximum Commercial Scenario.

Illinois Parcels

Development on the Illinois Parcels under the Maximum Commercial Scenario would include a maximum of about 762,000 GSF in new buildings (see Table 2). Construction under this scenario would provide up to 545 residential units (up to approximately 180 studio/one-bedroom units and 365 two-or-more bedroom units) totaling about 473,000 GSF, as well as approximately 238,300 GSF of commercial-office area and approximately 50,700 GSF of retail-light industrial-arts space in new buildings.

Table 2: Project Summary Table for Maximum Commercial Scenario

Uses	Existing Gross Square Footage	Existing Buildings to Be Rehabilitated	28-Acre Site New and Rehabilitated Construction	Illinois Parcels New Construction	Maximum Proposed Project Totals
Residential	0	N/A	957,000 GSF (Parcels C2, D, EI, E2, and E3)	473,000 GSF (Parcels PKN and PKS)	**1,430,000 GSF**
Residential Units	0	N/A	1,100 units	545 units	**1,645 units**
Commercial-Office	0	N/A	2,024,050 GSF[1] (Parcels A, B1, B2, C1, F, G, H1, H2, and Building 2)	238,300 GSF (Parcels PKN, HDY 1, and HDY 2)	**2,262,350 GSF**[1]
Retail-Light Industrial-Arts[2]	0	N/A	468,000 GSF (Parcels A, B1, B2, C1, C2, D, E1, E2, E3, E4, F, G, H1, H2 and Buildings 12 and 21)	50,700 GSF (Parcels PKN, PKS, HDY1, and HDY2)	**518,700 GSF**[1]
Existing Buildings	345,600	237,800 GSF[1]	–	–	**Included above**
Total GSF	***345,600***	***237,800***	***3,449,050 GSF***	***762,000 GSF***	***4,211,050 GSF***[1]
Parking Spaces - Off Street	171	0	2,700	645	**3,345**
Parking Spaces - On Street	152	0	–	–	**285**[3]
Open Space	0	N/A	6.5 acres	2.5 acres	**9 acres**

Notes:
[1] The existing 237,800 GSF of retained building space in Buildings 2, 12, and 21 on the 28-Acre Site would be renovated and converted into Commercial-Office, Retail-Light Industrial-Arts, or Residential uses. The Proposed Project's Total GSF reflects this retained and renovated space.
[2] Retail-light industrial-arts uses would be on the ground-floor levels of all future buildings on Parcels A, B1, B2, C1, C2, D, E1, E2, E3, F, G, H1, H2, PKN, PKS, HDY1 and HDY2. Parcel E4 and Buildings 12 and 21 would only contain retail-light industrial-arts uses. There would be no retail-light industrial-arts uses in Building 2.
[3] The street network planned as part of the Proposed Project would include all public roadways. This total number of on-street public parking spaces provided is an estimate, since this number does not yet account for the loss of potential on-street public parking spaces that may be associated with ADA parking and/or loading requirements (spaces are longer than traditional parking spaces), nor does it account for any requirements associated with turnaround regulations required by the San Francisco Fire Department.

Source: Forest City; Turnstone / SWCA

Maximum Building Heights and Representative Building Locations

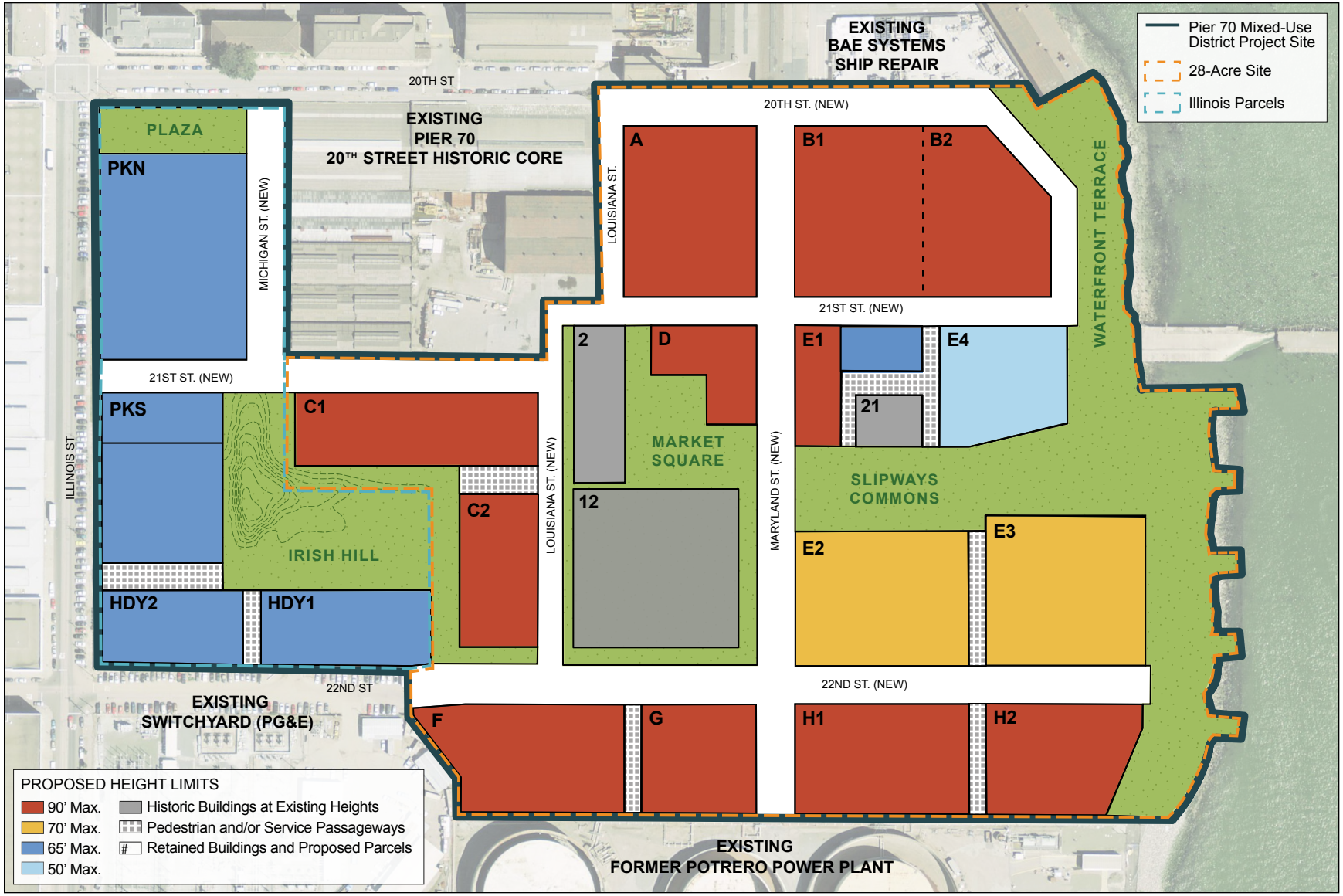
The proposed Pier 70 SUD would include amendments to the General Plan and Planning Code that would establish the height and bulk district on the project site, 90-X for the 28-Acre Site, except for a 100-foot-wide portion adjacent to the shoreline which would remain at 40-X, and 65-X for the Illinois Parcels. Through the incorporated proposed *Pier 70 Design for Development* document, further described below, varying maximum heights for the parcels at the project site within the proposed 90-foot and 65-foot bulk and height districts would be proposed. Maximum building heights would be generally limited to 50, 65, 70, and 90 feet, depending on location. (See Figure 6: Proposed Height Limits Plan.) The maximum building heights shown in the proposed Height Limits Plan do not specify the exact location of all of the future proposed buildings. Rather, they represent the proposed maximum heights across the project site.

On the 28-Acre Site, buildings up to 90 feet in height could generally be constructed along the southern, western, and northern perimeters. Existing Buildings 2 and 12, in the central portion of the site, would be retained at their existing heights of approximately 80 feet and 60 feet, respectively, as part of the Proposed Project. At the center and eastern portions of the site, new buildings would be limited to heights between 50 to 70 feet. Existing Building 21, which is about 45 feet tall, would be moved about 75 feet southeast from its current location to a new site just north of the proposed Slipways Commons open space to front on the waterfront park and maintain a visual connection to Buildings 2 and 12. The relocated Building 21 would be framed by new 90-foot-tall, 65-foot-tall, and 50-foot-tall buildings to the west, north, and east, respectively.

On the Illinois Parcels, maximum building heights would not exceed 65 feet. Proposed building locations on the 20th/Illinois portion of the site would front Illinois Street and the new 21st Street. Proposed development on the Hoedown Yard would front Illinois Street and the southern property line adjacent to 22nd Street.

Proposed Design for Development

A proposed *Pier 70 Design for Development* is part of the Proposed Project and will be incorporated into the proposed SUD. It is intended to reflect the long-term vision for the visual character and quality of the project site and would provide design standards and guidelines for building design, open space character, and the public realm. The SUD and proposed Design for Development would include development standards that would be mandatory, measurable quantitative design specifications, as well as design guidelines that would be more qualitative and flexible. The proposed Planning Code amendments (included in the proposed SUD) and the proposed Design for Development would, together, guide and control all development within the SUD after project entitlements are obtained. Subsequent submittals of proposed building design would be evaluated for consistency with both the proposed SUD and the Design for Development.



Source: Sitelab Studio, Turnstone Consulting/SWCA

Pier 70 Mixed-Use District Project

FIGURE 6: PROPOSED HEIGHT LIMITS PLAN

Parcels where flexibility among land uses would be allowed (e.g., either residential or commercial uses or structured parking options) would be identified in the proposed SUD. The proposed Design for Development would establish controls and parameters for bulk restriction, articulation and modulation, building materials and treatment, building frontage utilization, design parameters for open space, streets, parking and loading guidelines and standards, and utilities, such as lighting, as well as incorporate measures, as appropriate, identified in the EIR to mitigate any significant impacts. It would also address how the Proposed Project's individual buildings would fit within the overall Pier 70 area and adhere to a coherent urban design strategy. The standards in the proposed Design for Development are intended to relate new construction to other rehabilitation and reuse efforts at Pier 70, including the Historic Core project (currently under development by Orton Development, Inc.), Crane Cove Park, and the ongoing BAE ship repair facility use.

Affordable Housing Program

Under the Proposed Project, 30 percent of all completed residential units on the 28-Acre Site would be required to be offered at below market rate prices, and a majority of all residential units constructed would be available as rentals. The Proposed Project's affordable housing requirement would be established through transaction documents between the Port and Forest City for the Proposed Project.

Proposed Open Space

As shown on Figure 3: Proposed Land Use Plan, the Proposed Project would provide nine acres of publicly owned open space that are intended to achieve the following: supplement other Pier 70 waterfront improvements outside of the proposed SUD, including the proposed Crane Cove Park; extend the Blue Greenway[25] and Bay Trail through the southern half of Pier 70; and create an urban waterfront space, activated by the uses in the buildings adjacent to the waterfront-facing open spaces. All public open space would be owned by the Port.[26] Key components of the proposed open space program area are as follows:

- An approximately 5-acre waterfront park area, which would extend the Blue Greenway and Bay Trail through the southern half of Pier 70 and connect the 28-Acre Site's historic buildings to the waterfront (the Waterfront Terrace and Slipway Commons);
- A 1.5-acre plaza-type open space (Market Square) adjacent to Buildings 2 and 12, with open space suitable for markets, movie nights, or other programmed public gatherings;

[25] The Blue Greenway is a City of San Francisco project to improve the City's southerly portion of the 500-mile, 9-county, region-wide Bay Trail, as well as to extend the newly established Bay Trail and associated waterfront open space system. This 13-mile trail corridor will connect China Basin in the north to Candlestick Point State Recreation Area in the south. Trail information is available online at http://www.sf-port.org/index.aspx?page=1433, accessed April 17, 2015.

[26] Port ownership of the Irish Hill open space is subject to a jurisdictional transfer from the City to the Port.

- A 2-acre area (Irish Hill open space) adjacent to the existing remainder of Irish Hill, which could include a children's playground or other active recreation, on the Hoedown Yard;[27] and
- A 0.5-acre plaza (Plaza) on the 20th/Illinois Parcel, which would provide an open space for viewing buildings in the Historic Core.[28]

In addition to these open spaces, under the flexible land use program that could provide district parking on the two parcels located at Louisiana and the new 21st streets, the Proposed Project may include useable open space on the district parking structure rooftops that may consist of recreation/sports fields/courts, urban agriculture, or other publicly accessible uses. The spaces would be designed to be accessible from various locations on the 28-Acre Site, as well as from the Illinois Parcels. In addition, the Proposed Project buildings would provide private open space areas in the forms of balconies, courtyards, or other facilities, which would be accessible only to building occupants.

Proposed Traffic and Circulation Plan

Transit and Sustainability Overview

Towards the goal of achieving a sustainable land use development, the Proposed Project includes a transportation plan that prioritizes pedestrian and bicycle access, and will implement further measures to encourage alternative modes of transportation. The Proposed Project would encourage alternative modes of transportation by building a dense, walkable, mixed-use, transit-oriented development; encourage bicycling and walking; use Transportation Demand Management (TDM) strategies; prioritize safety, especially for bicyclists and pedestrians; and implement a shuttle service to connect Pier 70 to regional transit hubs. Entitlement and transaction documents would require the Proposed Project to establish a Transportation Management Agency (TMA) to coordinate and implement TDM measures, including the shuttle service.

Street Improvements and Circulation

As shown on Figure 3: Proposed Land Use Plan, the proposed primary streets on the project site would be 20th and 22nd streets, built out from west to east in straight lines. The proposed Maryland Street would be a secondary north-south running street. New minor streets proposed as part of the Project include a new 21st Street running west-to-east from Illinois Street to the Waterfront and Louisiana Street running north from 22nd Street, with an S-curve to accommodate existing historic structures, to 20th Street. All proposed streets would include sidewalks, as well as street furniture and on-street parking, where appropriate. With the exception of Louisiana Street between 20th Street and 21st Street, all proposed streets would be two-way, with a single lane of travel in each direction. Louisiana Street would be one-

[27] The Proposed Project assumes that PG&E has relocated from the Hoedown Yard and that the City will exercise its option to purchase the Hoedown Yard from PG&E.

[28] The Proposed Project assumes that the Port will sell the 20th/Illinois Parcel subject to a requirement for construction of a 0.5-acre publicly owned plaza (Plaza) at the entry to the site on 20th/Illinois Street.

way in the southbound direction, with a single lane of travel. There are no proposed bus routes or truck routes as part of the Proposed Project. The proposed streets would provide access for emergency vehicles and freight loading.

As part of the proposed project, Michigan Street from the north side of 22nd Street to 21st Street would be converted from a public street to private use, i.e., "vacated," and developed as part of the Illinois Parcels.

Transportation Demand Management

The Proposed Project would include an array of proposed TDM measures designed to encourage sustainable transportation choices and include the establishment of a TMA to manage implementation of TDM measures at the site. The Proposed Project would include a shuttle service to connect residents, workers, and visitors to regional transit hubs, including BART and Caltrain.

Bicycle and Pedestrian Improvements

The Proposed Project includes bike lanes, bike-safety-oriented street design, and bike-parking facilities to promote bicycling in and around the project site and project site vicinity. Bike amenities would be constructed on the project site to meet or exceed Planning Code requirements. Improvements proposed for the Proposed Project include construction of Class 2 facilities (bicycle lanes) and Class 3 facilities (shared-lane markings and signage) on 20th Street, 22nd Street and Maryland Street, and a separated bicycle and pedestrian facility would be provided to extend the Bay Trail and Blue Greenway the length of the project site shoreline. Pedestrian travel would be encouraged throughout the project site by establishing connected pedestrian pathways running both west-to-east and north-to-south to connect open spaces and by incorporating pedestrian-safe sidewalk and street design. The project site is designed to make the area east of Maryland Street a predominantly pedestrian zone, and there would be no vehicular streets along the length of the park, with the exception of 20th Street. Maryland Street and portions of 21st Street near the Bay would potentially have a shared street condition,[29] to reinforce the pedestrian connection from across streets to the Bay.

Parking

The Proposed Project would provide a restricted number of parking spaces to meet actual demand up to a predetermined maximum amount, as well as encourage more sustainable travel modes. If not developed as residential or commercial uses, planned district parking structures, located at the corner of Louisiana and new 21st streets, would provide shared parking for multiple uses. Certain parcels would also have below-grade parking. The Proposed Project would include car-share parking that would meet or exceed Planning Code requirements. All residential parking would be unbundled.

[29] Shared streets are generally curbless streets that maintain access for vehicles operating at low speeds and are designed to prioritize pedestrian travel by implicitly slowing traffic speeds using pedestrian volumes, design, and other cues to slow or divert traffic.

Proposed Infrastructure and Utilities

Potable and Recycled Water

To provide water for drinking and firefighting needs, the Proposed Project would include construction of potable water distribution piping in trenches located under the planned streets. To reduce potable water demand, high-efficiency fixtures and appliances would be installed in new buildings, and fixtures in existing buildings would be retrofitted, as required by City regulations. The project site lies within the City's designated recycled water area, and the Proposed Project would provide the piping needed to distribute recycled water, even though a supply of recycled water would not be available in the near term.[30]

At present, approximately 98 percent of the 28-Acre Site is covered by impervious surface and approximately 43 percent of the Illinois Parcels is covered by impervious surface. The Proposed Project would result in approximately 88 percent of the 28-Acre Site covered by impervious surface and approximately 87 percent of the Illinois Parcels covered by impervious surface.

Proposed Wastewater (Sewer) and Stormwater Treatment

The San Francisco Public Utilities Commission currently operates a combined collection system for sanitary sewage and stormwater from the project site. The combined wastewater flows to an existing pump station at the northeast corner of the project site. The pump station sends the flow through a 10-inch force main to the 27-inch gravity sewer main under Illinois Street within the right-of-way. From there, the sewage flows south to the Southeast Treatment Plant for treatment prior to discharge in the San Francisco Bay.

During infrequent occasions of extreme rainfall when the flows exceed pump capacity, the overflow backs up into a 54-inch storage pipe running north-south through the project site under existing Slipways 5, 6, 7, and 8, and the excess flow discharges into the Bay at Combined Sewer Overflow outfalls in the Bay outside the project site at the terminus of 20th and 22nd streets.

The Proposed Project anticipates retaining much of the existing combined sewer system and, if necessary, would upgrade the pump station on the project site to accommodate the site's existing uses and future development.[31] To handle increased sewage and wastewater flows from the Proposed Project's anticipated development, the project sponsors propose to construct wastewater and stormwater infrastructure in trenches under the Proposed Project's roadway and open space network and connect it to the existing outfall structures.

[30] BKF, Memorandum to Kelly Pretzer, Forest City, *Pier 70 - Utility Descriptions*, revised February 25, 2015, pp. 1-2.

[31] BKF, Memorandum to Kelly Pretzer, Forest City, *Pier 70 - Utility Descriptions*, revised February 25, 2015, pp. 3-4.

The approach to handling these flows has not yet been determined. One of three wastewater options would be implemented: a combined sewer and stormwater system, a separated sewer and stormwater system, or a hybrid approach, described below. All of these wastewater options will be studied in the EIR.

1. Combined Sewer and Stormwater System Option

   Under the combined sewer and stormwater system option, the existing pump station and western portion of the existing force main along the northern boundary of the project site would remain, and the eastern half of the existing force main would be replaced. Under San Francisco's Stormwater Design Guidelines, the Proposed Project would be required to reduce stormwater discharge from the project site by at least 25 percent. Methods available to decrease stormwater flow include capturing, retaining, and filtering runoff through Low Impact Design features such as planters, bioswales, biogutters, permeable paving, vegetated roofs, streams, ponds, and other natural filtration systems. Under this option, during infrequent occasions of extreme rainfall when the flows would exceed pump capacity, the excess flow would discharge into the Bay at the existing Combined Sewer Overflow outfall, in compliance with permits issued by the San Francisco Bay Regional Water Quality Control Board and pursuant to the City's National Pollutant Discharge Elimination System permit.

2. Separated Sewer and Stormwater System Option

   Under the separated sewer and stormwater system option, wastewater and stormwater would be conveyed in separate sanitary sewer and stormwater systems. Wastewater would be conveyed into the existing pump station, which would discharge to the existing gravity sewer system and treatment plant. A new stormwater system would be constructed with Low Impact Design features and in underground pipes below the proposed roadway network, and a new storm drain outfall would be constructed in the northeast corner of the project site that would flow into San Francisco Bay.

3. Combined Sewers with Separated Sewer in Eastern Portion of Project Site (Hybrid Approach)

   The third option would be a hybrid system with the combined sewer continuing to serve most of the project site. Under this hybrid approach, the project sponsor would also construct a new separate stormwater system to serve a portion of the eastern project site, including proposed open space areas, that would discharge to the Bay via a new outfall located at the base of the new 21st Street. Under this option, the project sponsors would also construct a new separate sewer system to convey wastewater from this area to the existing combined sewer system via the 20th Street Pump Station.

Electricity and Natural Gas

The Proposed Project would replace overhead electrical distribution with a joint trench distribution system following the roadways. The existing natural gas distribution system would be extended to cover the entire project site, and the piping would be realigned within the proposed roadway network to serve the project site. The Proposed Project would comply with San Francisco Green Building Requirements for energy efficiency in new buildings. Energy-efficient appliances and energy-efficient lighting would be installed in the three rehabilitated historic buildings.

Proposed Grading Plan

The Proposed Project would involve excavation of soils for grading and construction of the 15- to 27-foot-deep basements planned on the majority of the parcels. No basement levels are planned under existing Buildings 2, 12, or 21. The Proposed Project would also raise the grade of the 28-Acre Site and low-lying portions of the Illinois Parcels by adding between three to five feet of fill in order to help protect against flooding and projected future sea level rise, as described below.

A portion of the northern spur of the remnant of Irish Hill, which stands approximately 24 feet tall, would be removed for construction of the new 21st Street. Retaining walls would be necessary along the sides of the new 21st Street to protect the adjacent Building 116 and along the reconfigured 22nd Street, to account for the proposed elevation difference between the streets and adjacent ground surfaces.

While the grading plan assumes some on-site reuse of the excavation soil, which would be stockpiled and reused as fill throughout the project site, a substantial amount of soil export would be required. The Proposed Project would result in a net export total of about 340,000 cubic yards of soil and an import of about 20,000 cubic yards of clean fill, which would be phased over the duration of the planned construction activities.

Shoreline Protection

To address the potential hazard of future sea level rise in combination with storm and high tide conditions, the Proposed Project would make physical improvements in the near term to the shoreline that would provide the flexibility to accommodate future physical improvements such as berms, seawalls, or wetlands. Elevations at the shoreline would be increased by approximately four feet to address sea level rise risk and wave run-up, and the finished floor elevations for the ground floors of buildings on the 28-Acre Site would be increased to take into account the potential for future sea level rise of up to at least 55 and potentially as high as 66 inches. Included as part of the Proposed Project are financing mechanisms that would fund future improvements, if and when they would be needed.

Geotechnical Stabilization

To address the potential hazard of liquefaction and lateral spreading that may occur during a major earthquake, the proposed project would likely include construction of below-grade secant pile walls along the northeastern and southeastern portions of the project site. Secant pile walls could generally be constructed by installing a set of primary piles or concrete-filled drill holes, followed by an interlocking, secondary set of piles, with a concrete cap on top, which would be supported by micropile or tie-back anchors set at an angle.

PROJECT CONSTRUCTION PHASING AND DURATION

For both development scenarios, the Maximum Residential and the Maximum Commercial, Proposed Project construction is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve five phases, designated as Phases 1, 2, 3, 4, and 5. Traffic and circulation improvements, infrastructure improvements, open space improvements, and grading and excavation activities would occur in tandem, as respective and adjacent parcels are developed. The phasing schedule is described generally below.

Maximum Residential Scenario Construction Phasing and Duration

- ***Phase 1 (2018-2019):*** Phase 1 would introduce residential with potential ground-floor retail-light industrial-arts and commercial-office development on Parcel PKN of the Illinois Parcels.
- ***Phase 2 (2018-2020):*** Phase 2, which would overlap with a portion of Phase 1, would focus construction activities primarily in the central portion of the 28-Acre Site. Phase 2 would include space for residential use with potential ground-floor retail-light industrial-arts (Parcels E2, C2 and D and Building 2), commercial-office use with potential ground-floor retail-light industrial-arts (Parcel C1) and predominantly retail-light industrial-arts uses (Building 12).
- ***Phase 3 (2021-2023):*** Phase 3 would include construction of residential with potential ground-floor retail-light industrial-arts development on Parcel PKS of the Illinois Parcels and Parcels F and G along the southern boundary of the 28-Acre Site. Phase 3 would also introduce commercial-office space with potential ground-floor retail-light industrial-arts along the northern boundary of the 28-Acre Site (Parcel A).
- ***Phase 4 (2024-2026):*** Phase 4 would include construction of residential with potential ground-floor retail-light industrial-arts space on Parcels HDY1 and HDY2 of the Illinois Parcels, and on Parcels E1 and E3 along the eastern portion of the 28-Acre Site. Phase 4 would also include construction of commercial-office use with potential ground-floor retail-light industrial-arts on Parcels B1 and B2 along the northeastern boundary of the 28-Acre Site, and construction of retail-light industrial-arts uses on Parcel E4 and in Building 21 in the eastern portion of the 28-Acre Site.
- ***Phase 5 (2027-2029):*** Phase 5 would introduce residential with potential ground-floor retail-light industrial-arts development on Parcels H1 and H2 in the southeast boundary of the 28-Acre Site.

Maximum Commercial Scenario Construction Phasing and Duration

- ***Phase 1 (2018-2019):*** Phase 1 would introduce residential with potential ground-floor retail-light industrial-arts and commercial-office development on Parcel PKN on the Illinois Parcels.
- ***Phase 2 (2018-2020):*** Phase 2, which would overlap with a portion of Phase 1, would include construction of a residential with potential ground-floor retail-light industrial-arts development on Parcel PKS of the Illinois Parcels, and commercial-office with potential ground-floor retail-light industrial-arts on Parcel A located along the 28-Acre Site's northern boundary. Phase 2 would also introduce residential with potential ground-floor retail-light industrial-arts on Parcels D and E2, commercial-office use in Building 2, and retail-light industrial-arts use in Building 12, located in the central portion of the 28-Acre Site.
- ***Phase 3 (2021-2023):*** Phase 3 would include construction of commercial-office space on Parcels HDY1 and HDY2 on the Illinois Parcels and on Parcels F and G along the southern boundary of the 28-Acre Site. Phase 3 would also include construction of residential with potential ground-floor retail-light industrial-arts space on Parcels C2 and E1 located in the central portion of the 28-Acre Site.
- ***Phase 4 (2024-2026):*** Phase 4 would include construction of commercial-office with potential ground-floor retail-light industrial-arts on Parcels B1, B2, and C1, located in the northeastern and western portions of the 28-Acre Site. Phase 4 would also include construction of residential with potential ground-floor retail-light industrial-arts space on Parcel E3 and retail-light industrial-arts uses on Parcel E4 and in Building 21, located in the eastern portion of the 28-Acre Site.
- ***Phase 5 (2027-2029):*** Phase 5 would introduce commercial-office use on Parcels H1 and H2 along the southern boundary of the 28-Acre Site.

REQUIRED PROJECT APPROVALS

The Proposed Project is subject to review and approvals by several local, regional, and state agencies after completion of environmental review. Certification of the Final EIR by the San Francisco Planning Commission, which would be appealable to the San Francisco Board of Supervisors, is required before any other discretionary approvals or permits would be issued for the Proposed Project. An outline of anticipated main project approvals is as follows:

- Upon recommendation by the San Francisco Planning Commission and Port Commission, the San Francisco Board of Supervisors would consider adoption of amendments to the Planning Code text to establish the Pier 70 SUD, which would set forth development standards governing such matters as the allowable land uses, building height and bulk (consistent with Proposition B [June 2014] and Proposition F [November 2014]), parking and procedures for design review.
- The Pier 70 SUD would incorporate the *Pier 70 Design for Development*, which would establish specific land use controls, development standards, and design guidelines.
- The Port Commission would approve an amendment to the Port's Waterfront Land Use Plan to reflect the Pier 70 SUD and the *Pier 70 Design for Development.*
- The Port Commission and the Board of Supervisors would consider a Disposition and Development Agreement that would govern the project sponsors' contractual rights and obligations for development of the Proposed Project.

- Upon recommendation of the Planning Commission, the Board of Supervisors and other City agencies, as appropriate, would consider an action adopting a Development Agreement to vest the project approvals for a term of years.
- All City departments having jurisdiction over part or all of the project site would also consider an Interagency Cooperation Agreement that would set forth the procedures and standards for permit review.
- The Board of Supervisors would approve tentative and final maps for the Proposed Project in accordance with the Subdivision Map Act and applicable City laws and regulations.
- Rezoning the project site through the Pier 70 SUD requires approval by the State Lands Commission of a trust exchange agreement meeting the requirements of AB 418 under the Public Trust, and under which Public Trust is lifted from designated portions of Pier 70.

The Proposed Project will require additional project reviews, recommendations, permits or approvals from the following local, regional, and state agencies:

- San Francisco Port Commission, in consultation with the San Francisco Department of Building Inspection
- San Francisco Board of Supervisors
- San Francisco Planning Commission
- San Francisco Historic Preservation Commission
- San Francisco Public Utilities Commission
- San Francisco Department of Public Works
- San Francisco Municipal Transportation Agency
- San Francisco Department of Public Health
- San Francisco Bay Conservation and Development Commission
- California State Lands Commission
- San Francisco Bay Regional Water Quality Control Board
- Bay Area Air Quality Management District

In addition to the agencies listed above, depending on the inclusion of certain features of the Proposed Project, potential additional agencies include:

- California Public Utilities Commission
- National Park Service
- U.S. Army Corps of Engineers

SUMMARY OF POTENTIAL ENVIRONMENTAL ISSUES

The Proposed Project may result in significant environmental effects. As required by the California Environmental Quality Act (CEQA), an Environmental Impact Report (EIR) will be prepared and will examine these effects, identify mitigation measures for potentially significant impacts, and analyze whether proposed mitigation measures would reduce the environmental effects to less-than-significant levels. The EIR will analyze the potential effects of the Proposed Project with respect to the environmental topics listed below. Cumulative impacts will also be discussed under each of the environmental topic sections in the EIR. The EIR will also analyze alternatives to the Project that could substantially reduce or eliminate one or more significant impacts of the Project but could still feasibly attain most of the major Proposed Project objectives.

- Land Use and Land Use Planning
- Population, Housing, and Employment
- Cultural and Paleontological Resources
- Transportation and Circulation
- Noise
- Air Quality
- Greenhouse Gas Emissions
- Wind and Shadow
- Utilities and Service Systems
- Public Services
- Recreation
- Biological Resources
- Geology and Soils
- Hydrology and Water Quality and Sea Level Rise
- Hazards and Hazardous Materials
- Mineral and Energy Resources
- Agricultural and Forest Resources

OTHER CEQA ISSUES

The EIR will also include a discussion of topics required by CEQA, including the Proposed Project's growth-inducing impacts, significant unavoidable impacts, significant irreversible impacts, any known controversy associated with the Proposed Project, and its environmental effects and issues to be resolved by decision-makers.

FINDING

In accordance with CEQA Guidelines Section 15082, **this project may have a significant effect on the environment and an Environmental Impact Report is required.** As required by the CEQA, the EIR will focus on those effects, identify mitigation measures, and analyze whether the proposed mitigation measures would reduce the environmental effect to a less-than-significant level. The EIR will also evaluate a range of project alternatives, in addition to a No Project alternative, that could reduce, avoid, or eliminate significant impacts of the Proposed Project.

PUBLIC SCOPING PROCESS

Pursuant to the State of California Public Resources Code Section 21083.9 and California Environmental Quality Act Guidelines Section 15206, a public scoping meeting will be held to receive oral comments concerning the scope of the EIR. The meeting will be held from **Thursday, May 28, 2015,** from **6:00 p.m. to 8:00 p.m. in the Bayside Room at the Port of San Francisco, Pier 1, The Embarcadero.** To request a language interpreter or to accommodate persons with disabilities at the scoping meeting, please contact Andrea Contreras at (415) 575-9044 at least 72 hours in advance of the meeting. Written comments will also be accepted at this meeting and until **5:00 p.m.** on **June 5, 2015**. Written comments should be sent to Sarah B. Jones, San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103.

If you work for a responsible state agency, we need to know the views of your agency regarding the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the Proposed Project. Your agency may need to use the EIR when considering a permit or other approval for this project. Please include the name of a contact person in your agency.

Members of the public are not required to provide personal identifying information when they communicate with the Commission or the Department. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the Department's website or in other public documents.

May 6, 2015
Date

Sarah B. Jones
Environmental Review Officer

APPENDIX B: TRANSPORTATION IMPACT STUDY

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Prepared for

City and County of San Francisco Planning Department

Prepared by

FEHR & PEERS

Pier 70 Mixed-Use District Project

Transportation Impact Study

CASE NO. 2014.001272ENV!

December 2016

Transportation Impact Study

Pier 70 Mixed-Use District Project

Case Number: 2014.001272ENV!

Prepared for:

San Francisco Planning Department

Prepared by:

FEHR PEERS

December 2016

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1 INTRODUCTION

This report examines the existing transportation conditions in the vicinity of the Pier 70 Mixed-Use District Project (herein "Proposed Project") in San Francisco, California and analyzes the potential transportation impacts of the land use and transportation changes proposed as part of the Proposed Project. The Proposed Project would convert a portion of Pier 70 (currently 69 acres of land and structures comprising an industrial complex that hosts a ship repair yard and smaller commercial buildings such as storage facilities, artists' studios, and vacant buildings) into a mixed-use development composed of 1,645 to 3,025 dwelling units, 1,102,250 to 2,262,350 square feet of commercial use (office or research and development), 143,110 square feet of production, distribution, and repair (PDR) uses, 336,870 to 343,840 square feet of retail use (including restaurant), and 9 acres of open space. The Proposed Project also includes changes to the roadway network in the immediate area, including construction of street extensions, new sidewalks and bicycle facilities, transit improvements, an on-street and off-street vehicle parking program, and a Transportation Demand Management (TDM) Program.

This transportation impact analysis evaluates the Proposed Project's potential impacts on traffic, transit, bicycle, pedestrian, loading, emergency access, and construction conditions and operations using methods consistent with the *San Francisco Transportation Impact Analysis Guidelines for Environmental Review* (October 2002) (herein "*SF Guidelines*"). The report also includes a discussion of the Proposed Project's parking demand in relation to its proposed supply. This chapter summarizes the key attributes of the Proposed Project relating to transportation conditions, outlines the report structure, and describes the methodology used for analysis. The scope of work is provided in **Appendix A**.

1.1 PROJECT SETTING AND STUDY AREA

The Proposed Project development area is roughly bound by the San Francisco Bay, 22nd Street, Illinois Street, and 20th Street ("Proposed Project site"). The 35-acre Project site is located just south of Mission Bay South and east of the Potrero Hill and Dogpatch neighborhoods. US-101 and I-280, the Potrero Hill neighborhood, and the Dogpatch neighborhood are in the western vicinity of the Proposed Project site. The American Industrial Center, a large multi-tenant building with commercial, industrial, and related supporting uses, is located across Illinois Street, west of the Illinois Parcels. To the north of the Proposed Project site are the BAE Systems shipyards, the 20th Street Historic Core of the Union Iron Works Historic District, the future Crane Cove Park (construction to begin in 2017), and the Mission Bay South redevelopment area. To the south of the Proposed Project site are PG&E's Potrero Substation (a functioning high-voltage transmission substation serving San Francisco) and the decommissioned Potrero Power Plant. The site is currently occupied by smaller commercial buildings such as storage facilities, artists' studios, and vacant buildings, as well as asphalt lots. The site is largely fenced-off and disconnected from the surrounding neighborhoods, and public access to the shoreline is restricted. The site is currently zoned M-2 (Heavy Industrial) and P (Public) and is within the 40-X and 65-X Height and Bulk Districts.

The transportation study area (herein "study area") includes the area bound by the San Francisco Bay, Harrison Street, Third Street (north of Mariposa Street), Seventh Street, Arkansas Street, and Cesar Chavez Street. The study area was determined during the scoping process by selecting the facilities most likely to be affected by the Proposed Project. AT&T Park, home of the San Francisco Giants Baseball Club, is located approximately one mile north of the Proposed Project. The Golden State Warriors Arena is anticipated to be located at 16th Street and Third Street, just over one-half mile north of the Proposed Project. Though Giants games and other large events add demand to transportation facilities that would also be used by the Proposed Project, facilities in the immediate vicinity of the Proposed Project site are minimally affected by additional vehicle, pedestrian, and transit traffic during these events. **Figure 1** shows the location of the Proposed Project and the Proposed Project study area.

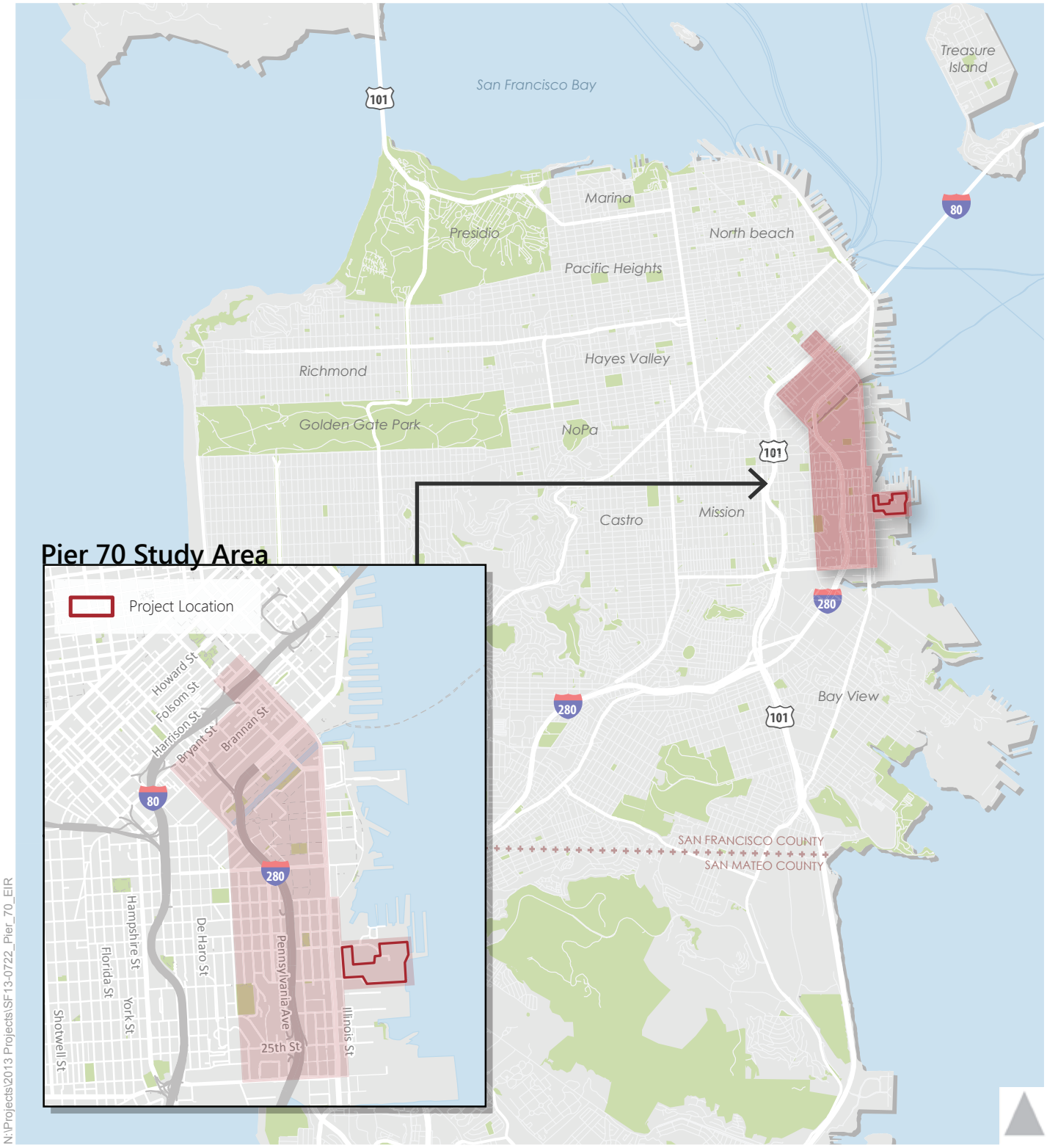

Figure 1

Project Study Area

1.2 PROJECT DESCRIPTION

The Pier 70 Mixed Use District Project ("Proposed Project") on a 35-acre site includes a mixed-use, multi-phase development on a portion of Pier 70 calls for the repurposing of historic resources as well as construction of new buildings, parks and open space and infrastructure in the southeast corner of the approximately 69-acre Port-owned area known as Pier 70. The Proposed Project includes two distinct parts. The first is an approximately 28-acre site (the 28 Acre Site) located between 20th Street, Michigan Street, 22nd Street and the San Francisco Bay (noted with the blue dotted outline on **Figure 2A**). The second is an approximately seven-acre site (the Illinois Parcels), comprised of both the 3.4-acre parcel located along Illinois Street at 20th Street (the 20th/Illinois Parcel) and the approximately 3.6-acre parcel at Illinois Street and 22nd Street (the Hoedown Yard). The Hoedown Yard parcel is owned by both the Port and PG&E, with the Port owning 0.2 acres and PG&E owning 3.4 acres. This area is denoted by the orange outline in **Figure 2A**. The eastern boundary of the Pier 70 Mixed-Use District is adjacent to the San Francisco Bay.

1.2.1 Land Use Program

The sponsor of the Proposed Project would rezone and establish development and design standards and controls for the area. The site currently consists of asphalt lots typically used for storage, other non-enclosed storage areas, a large radio antenna, and a PG&E soil recycling and equipment storage site. The 28 Acre Site would include up to approximately 3,422,000 gross leasable square feet (gsf) of above-grade construction in new buildings and improvements to historic buildings (excluding square footage allocated to accessory and district parking). The Illinois Parcels would include up to approximately 801,000 gsf of above-grade construction in new buildings. The Proposed Project proposes a flexible land use program, with both maximum residential-use and maximum commercial-use scenarios. Under all scenarios, the total above-grade construction would not exceed 3,422,000 gsf at the 28 Acre Site and 801,000 gsf at the Illinois Parcels, excluding parking, some of which may be provided below-grade (a discussion of parking is included on page 7). The Proposed Project would likely be built out in phases over the next 10 to 15 years.

The Maximum Residential Scenario and the Maximum Commercial Scenario for both the 28 Acre Site and the 20th/Illinois Parcel are not additive. For example, if the Proposed Project were to be built with the maximum amount of commercial space, only a correspondingly smaller amount of residential space could be built. The maximum commercial and maximum residential programs could not both be built. This flexible land use program is proposed to allow for a responsive development program, which takes into account future uses at the Potrero Power Plant and PG&E Substation facility at 22nd Street and Illinois Street.

In addition, two parcels (Parcels C1 and C2, shown in **Figure 2A**) within the Pier 70 Special Use District site have been designated for structured parking to be shared across multiple site uses, but could be developed with residential (Parcel C2) or commercial-office or residential (Parcel C1) uses in subsequent project development phases depending on future market demand and future transportation network changes. In the Maximum Residential Scenario, the land use totals assume that these two parcels are built as residential use, in order to study the maximum square footage of development area on the site. In the Maximum Commercial Scenario, the land use totals assume that Parcel C1 is built as office and Parcel C2 is built as residential use, in order to study the maximum square footage of development area on the site. The two book-end land use scenarios that have been identified (Maximum Residential Scenario and Maximum Commercial Scenario) are quantitatively summarized in **Table 1**.



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Source: Forest City Enterprises - March 2015

Figure 2A

Proposed Project Site Plan

TABLE 1: PROPOSED PROJECT LAND USES BY SCENARIO		
Land Use/Location	Maximum Residential Scenario	Maximum Commercial Scenario
28 Acre Site		
Residential[1]	2,150 DU	1,100 DU
Office	1,095,650 GSF	2,024,050 GSF
PDR[2]	143,100 GSF	143,110 GSF
Restaurant[2]	60,415 GSF	59,620 GSF
Retail[2]	241,655 GSF	238,485 GSF
Illinois Parcels		
Residential[1]	875 DU	545 DU
Office	6,600 GSF	238,300 GSF
PDR[2]	-	-
Restaurant[2]	6,960 GSF	9,145 GSF
Retail[2]	27,840 GSF	36,590 GSF
Total Proposed Project		
Residential[1]	3,025 DU	1,645 DU
Office	1,102,250 GSF	2,262,350 GSF
PDR[2]	143,110 GSF	143,110 GSF
Restaurant[2]	67,375 GSF	68,765 GSF
Retail[2]	269,495 GSF	275,075 GSF
Parks and Expanded Waterfront Public Open Space	9 Acres	9 Acres

Notes:

1. The exact mix of dwelling unit types to be provided by the Project has not been established at this time; for travel demand purposes, it has been assumed that 33 percent of the total number of dwelling units under each scenario would be analyzed as studios or 1-bedroom units, while 67 percent would be analyzed as having two or more bedrooms. See *Pier 70 Mixed-Use District Project – Estimation of Project Travel Demand*" in Appendix E for more information.
2. "PDR" includes arts and light industrial uses. The exact allocation of light industrial and arts uses to be provided by the Project has not been established at this time; for travel demand purposes, it has been assumed that there would be a fixed amount of PDR space, and of the remainder 80 percent would be analyzed as retail use, while 20 percent would be analyzed as restaurant use. See *Pier 70 Mixed-Use District Project – Estimation of Project Travel Demand*" in Appendix E for more information.

Source: Forest City Enterprises and Adavant Consulting, 2016.

In summary, the type of land uses proposed at the Proposed Project site are:

- **Housing.** Housing would be located throughout the Proposed Project site. The Proposed Project would provide between 1,645 and 3,025 residential units consisting of primarily studios, one and two bedroom apartments.

- **Commercial / Office.** The development would contain between approximately 1.1 and 2.3 million gsf of office space, and other commercial uses, such as arts and activity spaces, bars, gyms, and childcare facilities.

- **Retail/Light Industrial/Arts.** The development would contain between approximately 480,000 and 487,000 gsf of space proposed to include small-scale manufacturing, local retail, creative uses, restaurants, and arts. This total is the sum of PDR, restaurant, and retail uses included in **Table 1**.

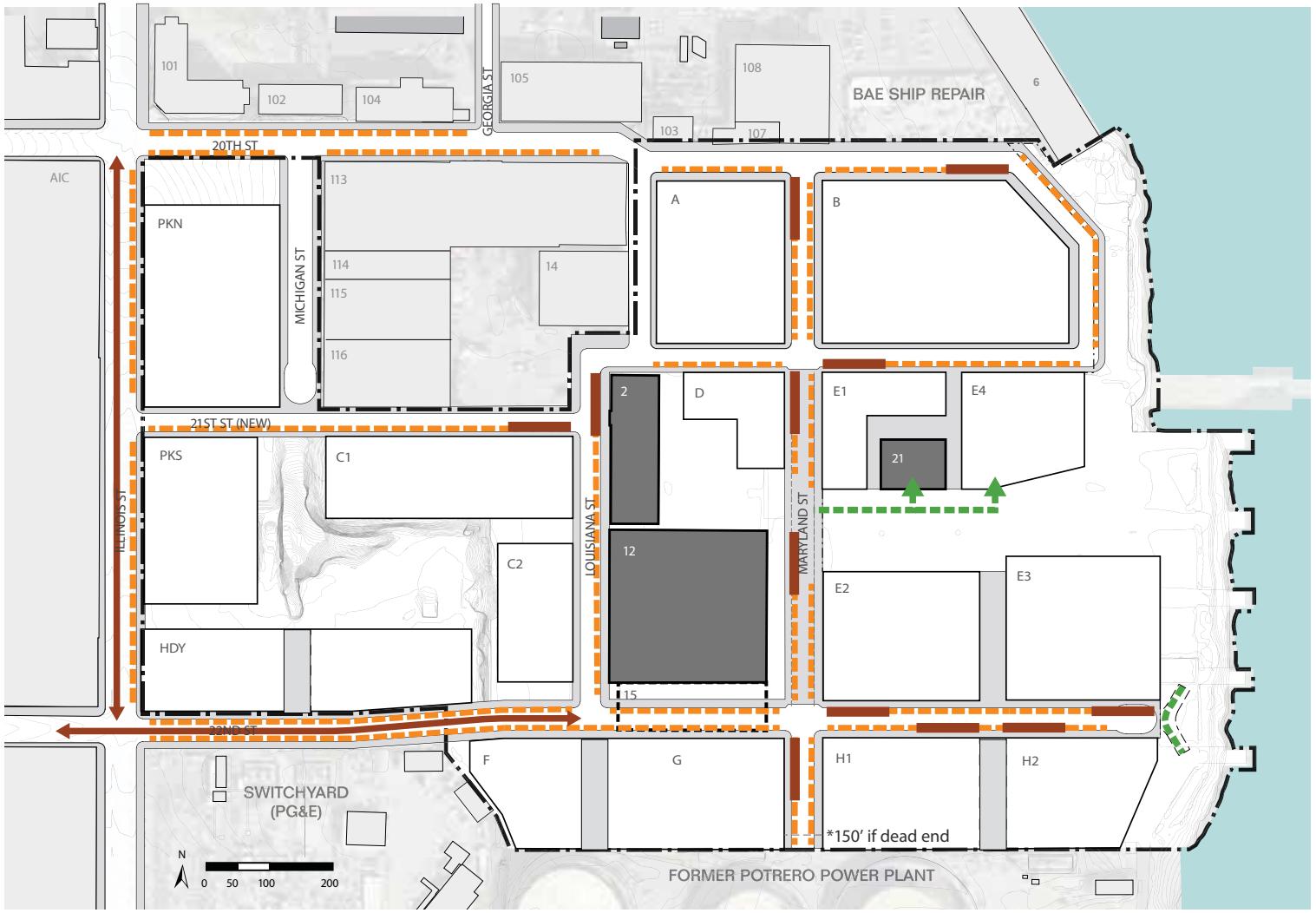
- **Open Spaces and Parks.** Nine acres of new and expanded waterfront public open space would be included in the Proposed Project, including extending the Blue Greenway and Bay Trail through the southern half of Pier 70.

- **Parking.** The Maximum Residential Scenario would provide up to 3,370 new off-street parking spaces and approximately 228 net new metered on-street parking spaces on new proposed streets.[1] The Maximum Commercial Scenario would provide up to 3,496 new off-street parking spaces and approximately 228 net new on-street parking spaces. Potential parking areas can be seen in **Figure 2B** and **Figure 2C**. These totals reflect one parking space per 1,000 square feet of commercial, retail, arts, and light industrial development and 0.75 parking spaces per residential unit. The Proposed Project does not propose expansion of the adjacent Residential Permit Parking Program (RPP) for on-street parking spaces.

The Proposed Project would create a new nine-acre waterfront open space network that is intended to: (a) complement waterfront improvements adjacent to the Pier 70 Mixed-Use District that include the new Crane Cove Park; (b) extend the Blue Greenway and Bay Trail through the southern half of Pier 70; (c) retain the industrial history of the site; and (d) establish an urban waterfront with a local character that is activated by the uses in the buildings adjacent to the open spaces. Key components of the open space program would include a courtyard-type open space (Market Square); an open-space zone connecting the 28 Acre Site's existing buildings to the waterfront (Slipways Commons); a playground area adjacent to the existing Irish Hill (Irish Hill Playground); and a plaza at Illinois Street and 20th Street at the entry to the site.

In addition to the nine acres of open space described above, the Proposed Project would potentially include useable open space on the rooftops of up to two shared parking structures that may consist of recreation/sports fields/courts, urban agriculture, or other publicly-accessible uses. The spaces would be designed to be easily accessible from various locations on the 28 Acre Site, as well as from Illinois Street. Because this potential rooftop space would only be built if shared parking structures are built, it is not included in the nine acre overall open space area calculation. Parcels C1 and C2, which may be developed as structured parking, have been studied as either residential or office uses, depending on the Proposed Project scenario, and therefore these parcels are assumed to have trip generating uses. This assumption analyzes the maximum possible impacts because if constructed as commercial or residential uses, they would generate more trips than if constructed as parking with rooftop open space.

[1] While the Proposed Project would provide 285 parking spaces, it would also remove 57 existing parking spaces, resulting in 228 net new parking spaces.



PIER 70 SPECIAL USE DISTRICT
EXAMPLE SCENARIO OF FIRE TRUCK ACCESS - MAX RESIDENTIAL
February 04, 2016
*All boundaries are approximate

SITELAB

FIRE ACCESS STRATEGIES

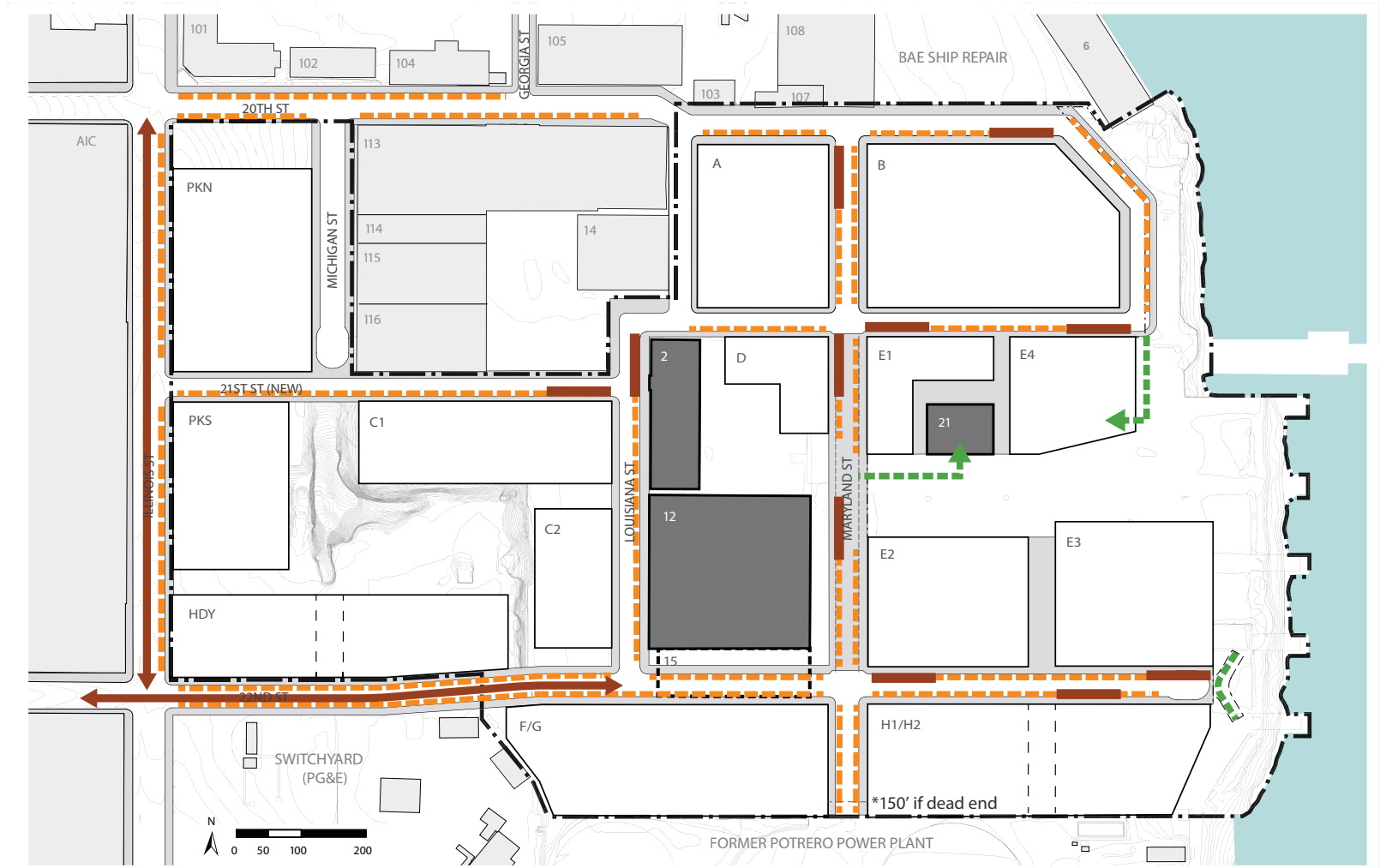
- Streets with a Minimum 26' Clear ROW for Fire Access
- 100' Building "Fire Access Strategy"
- Turnaround for Fire Truck Access
- Potential Fire Access within Park
- On-street Parking

ON-STREET PARKING CALCULATIONS

On-street Parking Provided	6000 LF / ±285 Stalls
Fire Access Zones	1200 LF
On-street Parking Loss	±57 Stalls
Remaining on Street Parking	4800 LF / ±228 Stalls

Figure 2B.i

Proposed Project Site On-Street Parking - Maximum Residential Scenario



PIER 70 SPECIAL USE DISTRICT
EXAMPLE SCENARIO OF FIRE TRUCK ACCESS - MAX OFFICE
February 04, 2016
*All boundaries are approximate

SITELAB urban studio

FIRE ACCESS STRATEGIES

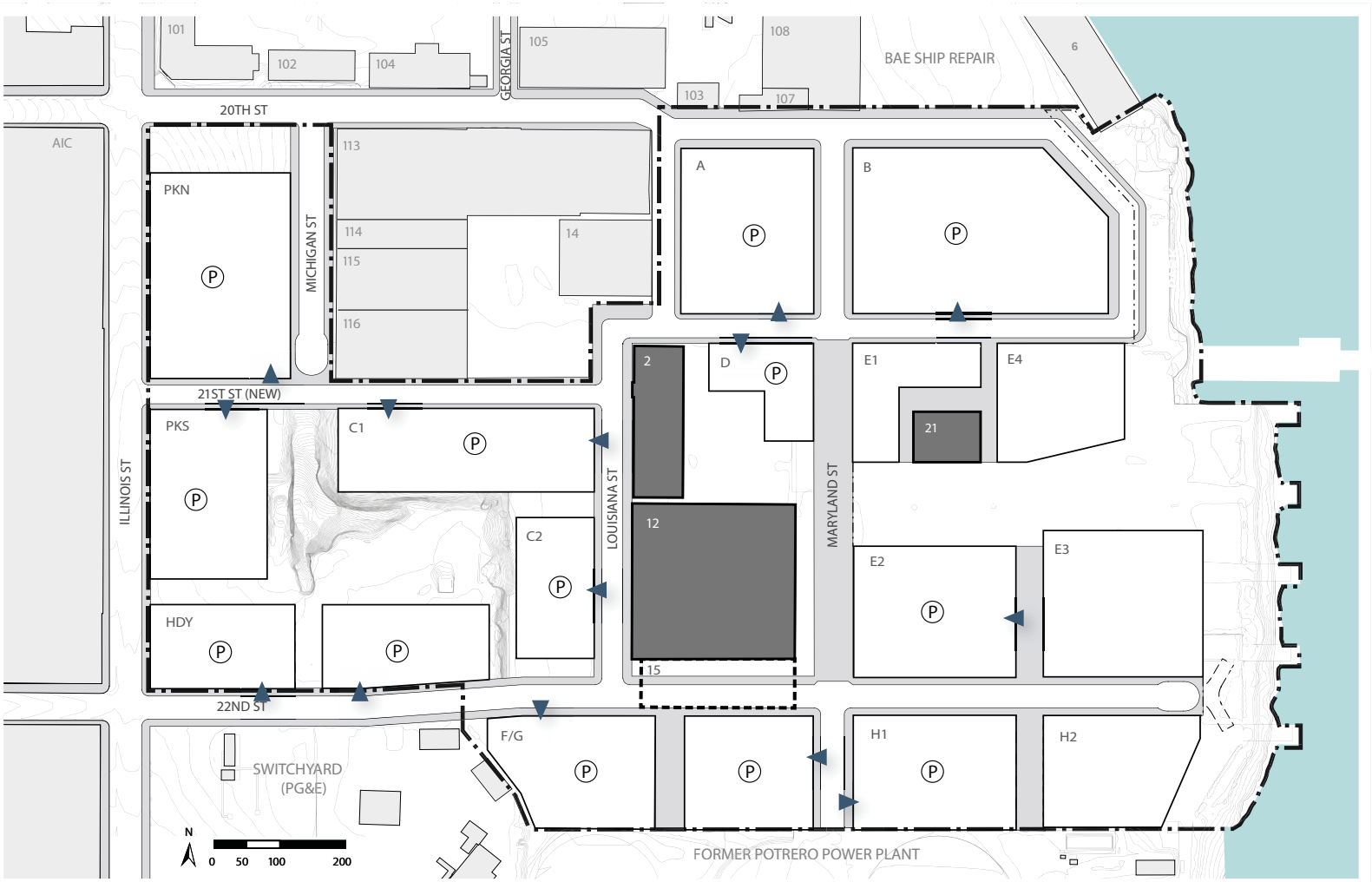
- Streets with a Minimum 26' Clear ROW for Fire Access
- 100' Building "Fire Access Strategy"
- Turnaround for Fire Truck Access
- Potential Fire Access within Park
- On-street Parking

ON-STREET PARKING CALCULATIONS

On-street Parking Provided	6000 LF / ±285 Stal
Fire Access Zones	1100 LF
On-street Parking Loss	±52 Stalls
Remaining on Street Parking	4900 LF / ±232 Stal

Figure 2B.ii

Proposed Project Site On-Street Parking - Maximum Commercial Scenario



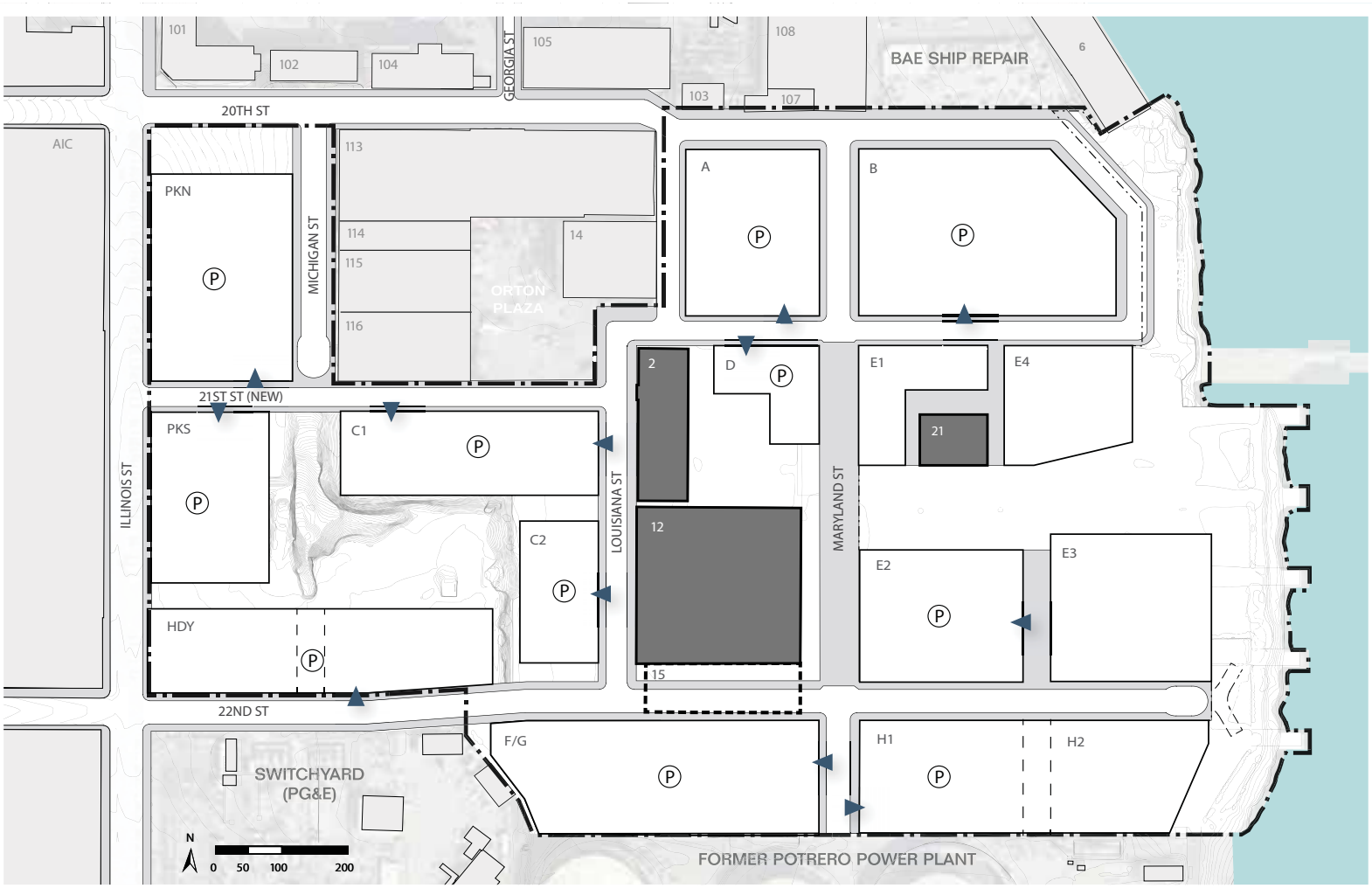
PIER 70 SPECIAL USE DISTRICT
EXAMPLE SCENARIO OF GARAGE ENTRANCES - MAX RESIDENTIAL
February 04, 2016
*All boundaries are approximate

SITELAB urban studio

PARKING STRUCTURE ENTRANCE
(P) Parking Structure
Suggested Parking Structure Entrance

Figure 2C.i

Proposed Project Site Off-Street Parking - Maximum Residential Scenario



PIER 70 SPECIAL USE DISTRICT
EXAMPLE SCENARIO OF GARAGE ENTRANCES - MAX OFFICE
February 04, 2016
*All boundaries are approximate

SITELAB urban studio

PARKING STRUCTURE ENTRANCE
(P) Parking Structure
◀ Suggested Parking Structure Entrance

Figure 2C.ii

Proposed Project Site Off-Street Parking - Maximum Commercial Scenario

The Proposed Project's open space includes programming elements that are anticipated to include art an cultural events, outdoor fairs, festivals and markets, and other public events. Currently, the site hosts approximately 50 events per year, which include evening happy hours, music concerts, fairs, and markets. In addition to those types of events, events on the Proposed Project site in the future could include outdoor film screenings, night markets, food events, street fairs or festivals, lecture series, art exhibitions, and theater performances during weekdays and weekends. Typical events, occurring up to an estimated three times per month, could have attendance of approximately 500 to 750 people, while larger-scale events, occurring approximately four times per year, could have attendance of up to 5,000 people.

1.2.2 Roadway Network Improvements

The Proposed Project site would be accessible via Illinois Street at 20th Street, 22nd Street, and a new 21st Street connection. The speed limit of the new roadway network would be 25 miles per hour to increase pedestrian and bicycle safety and reduce vehicular collisions. Streets would be designed to the minimum width feasible to calm traffic and increase pedestrian safety while still accommodating required design vehicles, such as fire trucks, transit vehicles, and deliveries. No improvements are proposed outside of the Proposed Project site.

The Proposed Project proposes a shared public way on Maryland Street between 21st Street and 22nd Street. This shared street would have limited vehicular traffic and would give priority to pedestrians over automobiles. This street would consist of a single shared paved surface with no curbs or gutters. Automobiles could access it from the adjoining streets by a curb cut similar to a typical driveway. The proposed shared public way would allow for temporary closures of the street to vehicular traffic for markets and events. The shared public way would be adjacent to the open space connecting to the Blue Greenway and the San Francisco Bay. Interior roadways are summarized in **Table 2** and shown in **Figure 2D**. Roadway network changes proposed by the Proposed Project, as described in this section, were included in the transportation network for all Plus Project scenarios.

TABLE 2: PROJECT SITE STREET TYPE AND RIGHT-OF-WAY (ROW) WIDTH

Street	Street Type	Travel Lanes	Roadway Width[1]
20th Street West (Illinois street to Georgia Street)	Mixed Use Street	2	36′
20th Street East (Georgia Street to the Waterfront)	Mixed Use Street	2	29'
20th Street, at the Waterfront	Park Edge Street	2	29'
21st Street West (Illinois Street to Louisiana Street)	Alley	2	29'
21st Street East (Louisiana Street to the Waterfront)	Alley	2	27'
22nd Street West (Illinois Street to Louisiana Street)	Mixed Use Street	2	36'
22nd Street East (Louisiana Street to the Waterfront)	Mixed Use Street	2	36'
Louisiana Street North (20th Street to 21st Street)	Alley	2	34'[2]
Louisiana Street South (21st Street to 22nd Street)	Mixed Use Street	2	29'
Maryland Street North (20th Street to 21st Street)	Mixed Use Street	2	36'
Maryland Street South (22nd Street to Proposed Project site boundary)	Mixed Use Street	2	36'
Maryland Street, 21st Street to 22nd Street	Shared Public Way	2	36'
Michigan Street	Industrial Street	2	38'

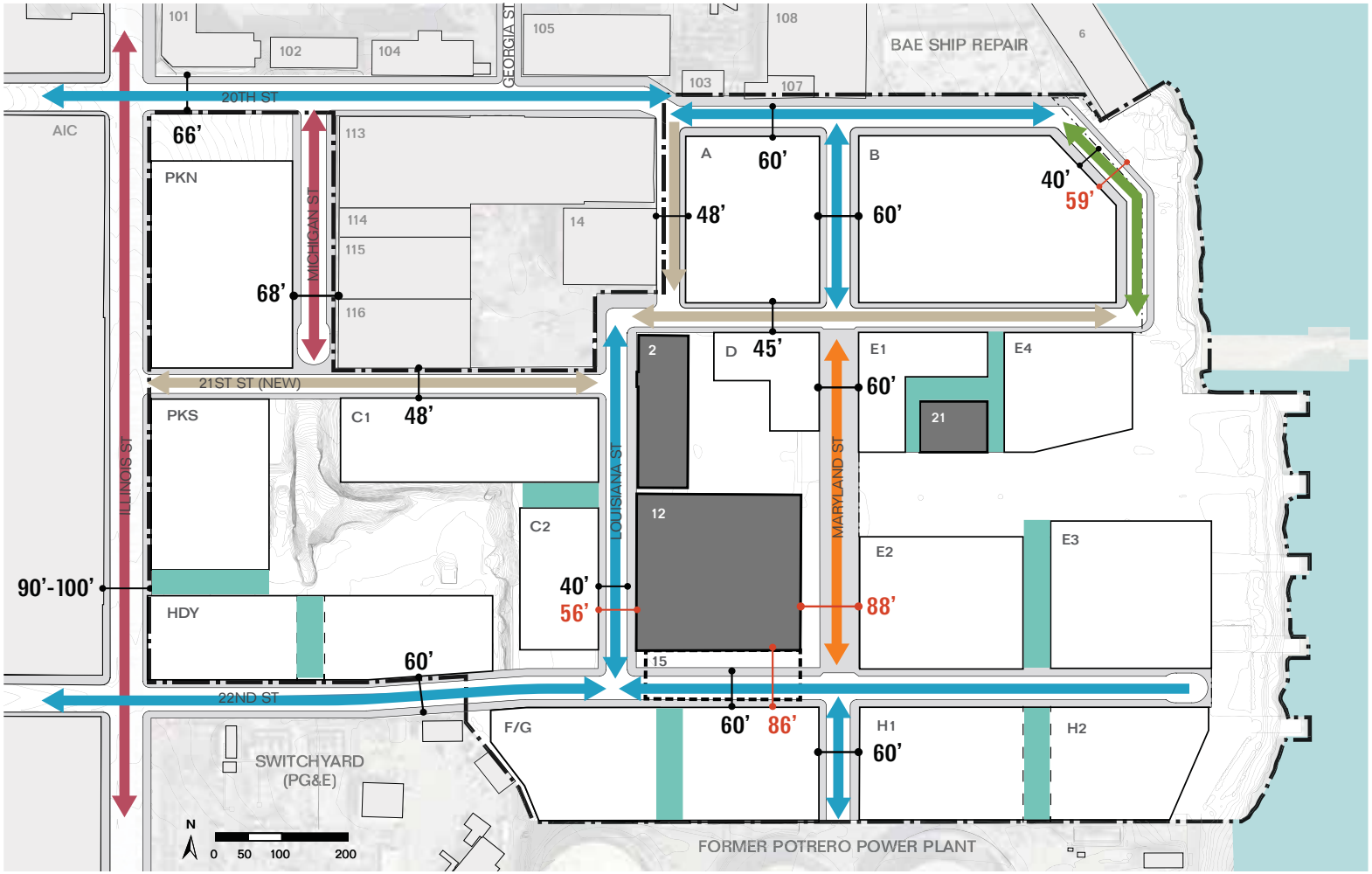
Notes:
1. Roadway width shown is curb-to-curb width (where curbs exist).
2. 12′ loading, 15′ travel lane, 7′ parking lane
Source: Pier 70 Design Guidelines, April 2016.

1.2.3 Bicycle Circulation Improvements

The Proposed Project bicycle network is presented in **Figure 2E**. The Proposed Project proposes a separated bicycle and pedestrian facility along 20th Street that would extend the Bay Trail/Blue Greenway continuously along the shore of the Proposed Project site. At the northern end, the Bay Trail extends via 20th Street to Georgia Street and 19th Street. At the southern end, the trail would temporarily access Illinois Street via 22nd Street, but would connect to any further extension of the Bay Trail south of the Project site. Class II bicycle lanes[2] and Class III shared lanes are proposed throughout the Proposed Project site. Class II (seven-foot) bicycle lanes are proposed on 22nd Street west of Louisiana Street (westbound only). Class III facilities are provided on Maryland Street (both directions), 20th Street west of Georgia Street (both directions), 22nd Street west of Louisiana Street (eastbound only), and 22nd Street east of Louisiana Street (both directions).

No improvements are proposed outside of the Proposed Project site.

[2] Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles, while Class III bikeways are signed bike routes that allow bicycles to share the travel lane with vehicles. See Section 2.7 for additional discussion.



PIER 70 SPECIAL USE DISTRICT
RIGHT-OF-WAY, SETBACKS, AND ZONE WIDTHS
February 04, 2016
*All boundaries are approximate

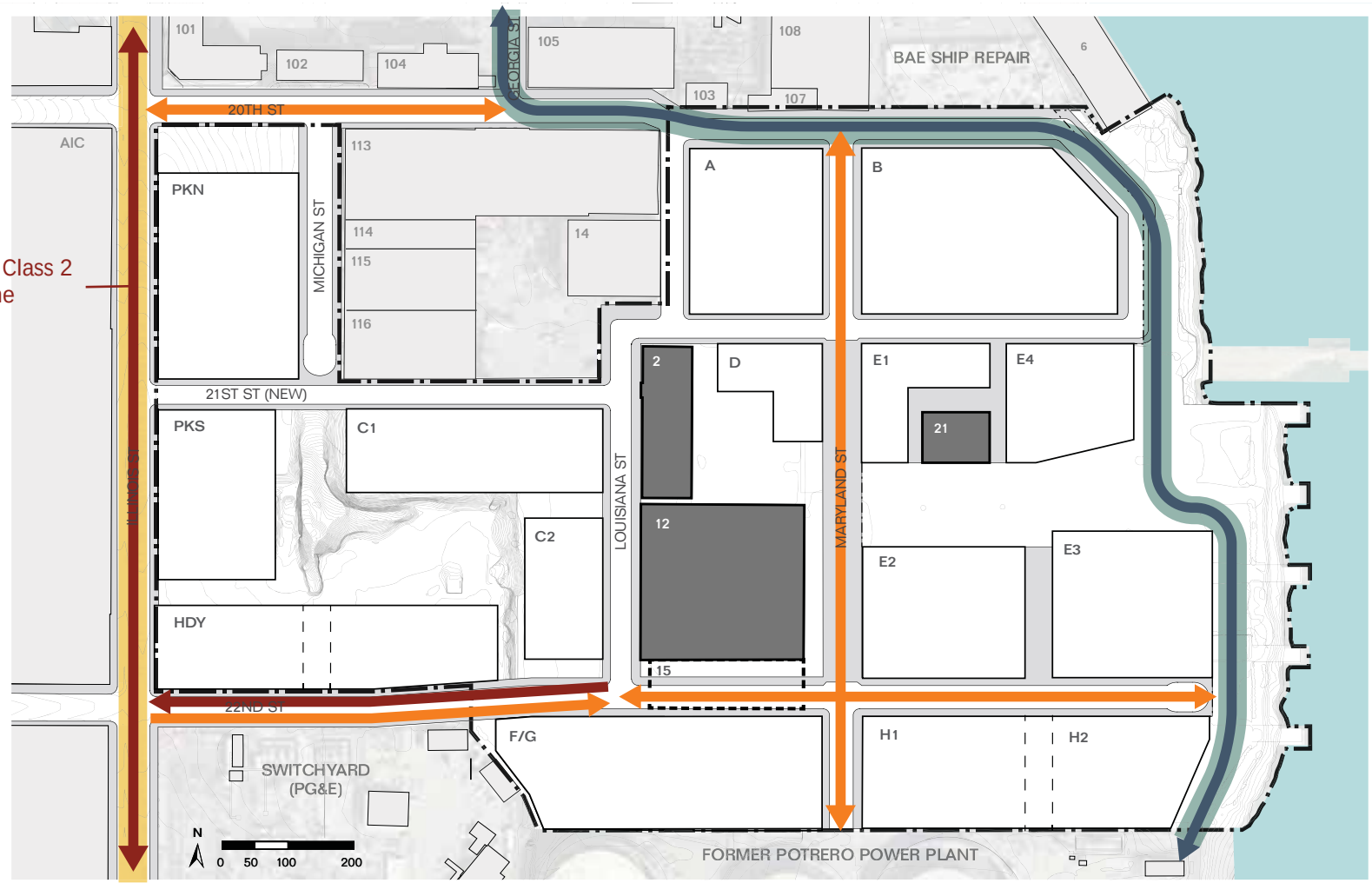
SITELAB urban studio

RIGHT-OF-WAYS, SETBACKS & ZONE WIDTHS

- Mixed-Use Streets
- Shared Public Ways
- Park Edge Street
- Industrial Street
- Alley
- ROW Width
- Width Including ROW Setback
- Private ROW for Pedestrian and / or Vehicular Access

Figure 2D

Proposed Project Site Roadway Network



PIER 70 SPECIAL USE DISTRICT
BICYCLE NETWORK
February 04, 2016
*All boundaries are approximate

SITELAB urban studio

BICYCLE NETWORK

- Bay Trail / Blue Greenway
- Class 2 Bike Lane
- Sharrows
- Leisure / Slow / Waterfront Route
- Commuter / Quick route

Figure 2E

Proposed Project Site Bicycle Network

1.2.4 Transit Improvements

The Proposed Project site transit network is presented in **Figure 2F**. The Proposed Project has been designed such that San Francisco Municipal Railway (Muni) could directly service the Proposed Project along 22nd Street, through extension of an existing bus route, though no such plans are currently proposed. 22nd Street has a 60-foot right-of-way through the Proposed Project site that could be used for transit service. Muni bus routes 22 Fillmore and 48 Quintara/24th Street and the T-Third light rail line operate near the site and provide connections to regional transit providers serving the North Bay, the Peninsula, and the East Bay. These routes may be subject to future changes that modify their alignment to better serve the Proposed Project, although no changes are proposed at this time.

1.2.5 Proposed Shuttle Service

The Proposed Project is also proposing a shuttle service for the Proposed Project site, operated and maintained by a Pier 70 Transportation Management Agency (TMA), to connect the Pier 70 Mixed-Use District to regional transit hubs. The purpose of the shuttle service would be to supplement existing Muni service. Shuttle service would grow over time to reflect the demand to and from Pier 70 and the surrounding transit hubs. The shuttle service would be operated by the TMA through a third-party service provider and would have no fare associated with it. The TMA would be led by a Board of Directors that could include the Port, the SFMTA, and representatives of various buildings constructed at the site. TMA funding would come from the building developers and/or owners through fee assessments on building parcels. Per the *Pier 70 Special Use District Transportation Plan – Preliminary Shuttle Service Concept* memo developed by AECOM (2015), two conceptual shuttle routes have been identified, as shown in **Appendix B**:

- **Fourth and King Route:** One route would connect directly to Mission Bay and the Caltrain terminal at Fourth and King Station. The current train schedule serving 22nd Street Station does not afford potential employees of the site the desired flexibility in choosing trains. Providing a shuttle to the San Francisco terminal at Fourth and King Station would avoid these issues by allowing employees to choose any train serving their origin station. Such a shuttle would also be key in connecting to the growing mixed-use district of Mission Bay, including potential key destinations such as the UCSF Mission Bay Campus, the Mission Bay Public Safety Building, and the Mission Rock development. This route could also be extended to Market Street to better connect with BART and Muni Metro or to the Transbay Transit Center to better connect with regional transit providers such as AC Transit and Golden Gate Transit. The route would include four stops: 22nd Street / Louisiana Street, Fourth and King Station, 20th Street / Louisiana Street, and Maryland Street / 21st Street. The estimated cycle time for this route would be 28 minutes. Based on a uniform 15-minute headway, two shuttles would be needed operate this route.

- **22nd Street Station and 16th Street / Mission Station Route:** A second route would serve 16th Street / Mission Station, providing the necessary connection to BART. This route would also provide a connection to the Mission Street corridor (14 Mission, 14R Mission Rapid, and 49 Van Ness–Mission routes), one of Muni's busiest transit corridors. It could also accommodate a stop at Potrero Avenue/16th Street to capture ridership from the busy Potrero Avenue/Bayshore Boulevard/San Bruno Avenue corridor (9 San Bruno, 9R San Bruno Rapid), coordinating with proposed high-tier investments under the San Francisco Transportation Plan to provide bus rapid transit ("BRT") service in this corridor. The route would also serve the Mission, including neighborhood commercial corridors along Mission Street, 16th Street, and Valencia Street. Additionally, this route would likely include a stop at Caltrain's 22nd Street Station. While the station is technically within walking and biking distance, providing a shuttle connection would attract choice riders

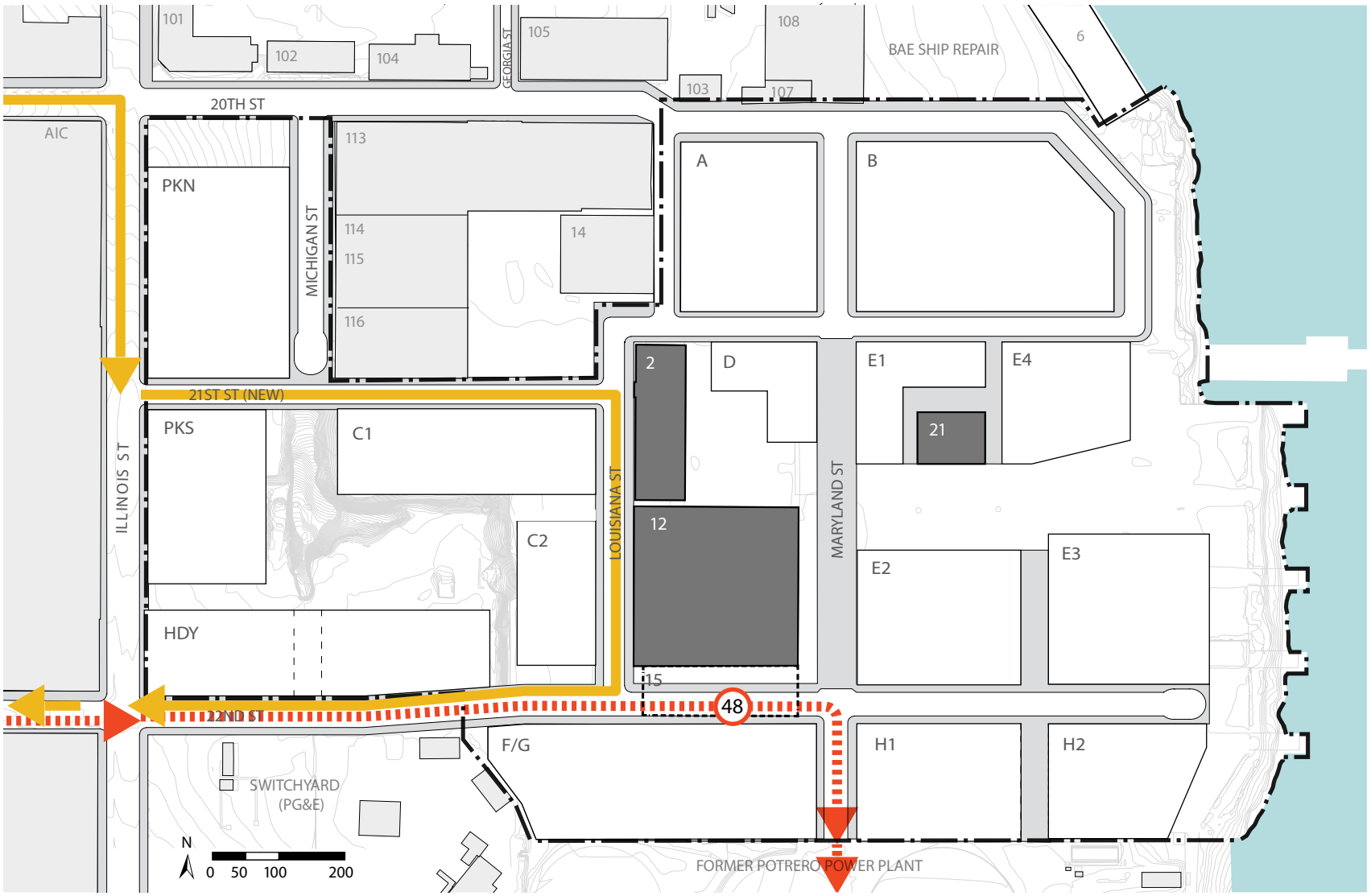
and less able-bodied riders (such as the disabled or elderly). In addition, the route could be especially useful during evenings, when public safety may be a concern for potential Caltrain passengers, or during inclement weather. The route would include three stops: Maryland Street / 21st Street, 22nd Street Station (Caltrain), and 16th Street / Mission Station (BART). The estimated cycle time for this route would be 40 minutes. Based on a uniform headway, three shuttles would be needed to operate this route.

Exact routes and operating schemes have not yet been determined, but would be developed in consultation with the San Francisco Planning Department and SFMTA; these routes are dependent on factors such as peak-period traffic congestion along specific streets as well as BART and Caltrain service plans and schedules at specific stations. The service would at least be provided during the extended weekday commute periods (7:00 AM to 10:00 AM and 3:00 PM to 7:00 PM) and would function as a bi-directional service, reflecting the mixed-use residential and commercial nature of the Proposed Project. Shuttle service during other time periods (e.g., weekends or midday) or during special events would also be considered on a temporary, as-needed basis. Shuttle service is not intended or anticipated to replace or duplicate Muni service for local trips.

Stops would be concentrated to serve the core and eastern portions of the site that are furthest from the transit routes along Third Street. Off-site transit hubs would be located close to access routes to the connecting transit, and if necessary, curb accommodations would be negotiated with SFMTA. Shuttles would potentially use existing Muni (red) or passenger loading (white) zones at these locations, or new passenger loading zones could be designated (and potentially shared with other shuttle services).

Vehicles are anticipated to have a seating capacity of up to 25 passengers. Three vehicles are planned for the 22nd Street Station and 16th Street / Mission Street BART Station route (40 minutes round trip), and two vehicles are planned for the Fourth and King Caltrain Station route (28 minutes round trip). With all vehicles full of patrons inbound and outbound, the shuttle service would have a combined capacity of approximately 400 shuttle riders per hour.

Events at Pier 70 could also have shuttle service, but this service would be part of a suite of event-specific transportation demand management strategies.



Potential Muni Route Extension

Shuttle Bus Route

Figure 2F

Proposed Project Site Transit Network

1.2.6 Pedestrian Circulation Improvements

The Proposed Project site pedestrian network is presented in **Figure 2G**. The pedestrian network and experience is designed to facilitate an active and accessible public realm while serving the needs of operations traffic movement. Minimum sidewalk widths have been proposed for each street, ranging from six feet to twelve feet (shown in **Table 3**). Curb extensions are planned at key locations on corners and mid-block locations wherever feasible in order to increase pedestrian visibility, shorten crossing distance, and decrease vehicle speeds.

No improvements are proposed outside of the Proposed Project site.

TABLE 3: PROPOSED SIDEWALK WIDTHS

Street Segment	Project Minimum Sidewalk Width	Project Minimum Throughway Width	Project Proposed Throughway Width
	(West Side / East Side) or (North Side / South Side)		
20th Street West (Illinois Street to Georgia Street)	15'/15'	6'	9.5'/8.5'
20th Street East (Georgia Street to the Waterfront)	16'/15'	6'	6'/9.5'
20th Street (at the Waterfront)	18'/-	8'	9'/-
21st Street East (Illinois Street to Louisiana Street)	9.5'/9.5'	6'	6'/6'
21st Street West (Louisiana Street to the Waterfront)	9'/9'	6'	6'/6'
22nd Street West (Illinois Street to Louisiana Street)	12'/12'	6'	7'/7'
22nd Street East (Louisiana Street to the Waterfront)	12'/12'	6'	7'/7'
Maryland Street (21st Street to 22nd Street)	12'/12'	8'	8'/8'
Maryland Street (North of 21st Street and South of 22nd Street)	12'/12'	6'	8'/8'
Louisiana Street North (20th Street to 21st Street)	-/9'	6'	-/6'
Louisiana Street South (21st Street to 22nd Street)	12'/12'	6'	9'/12'
Michigan Street	10'/10'	6'	6'/-

Source: Pier 70 Design Guidelines, April 2016.

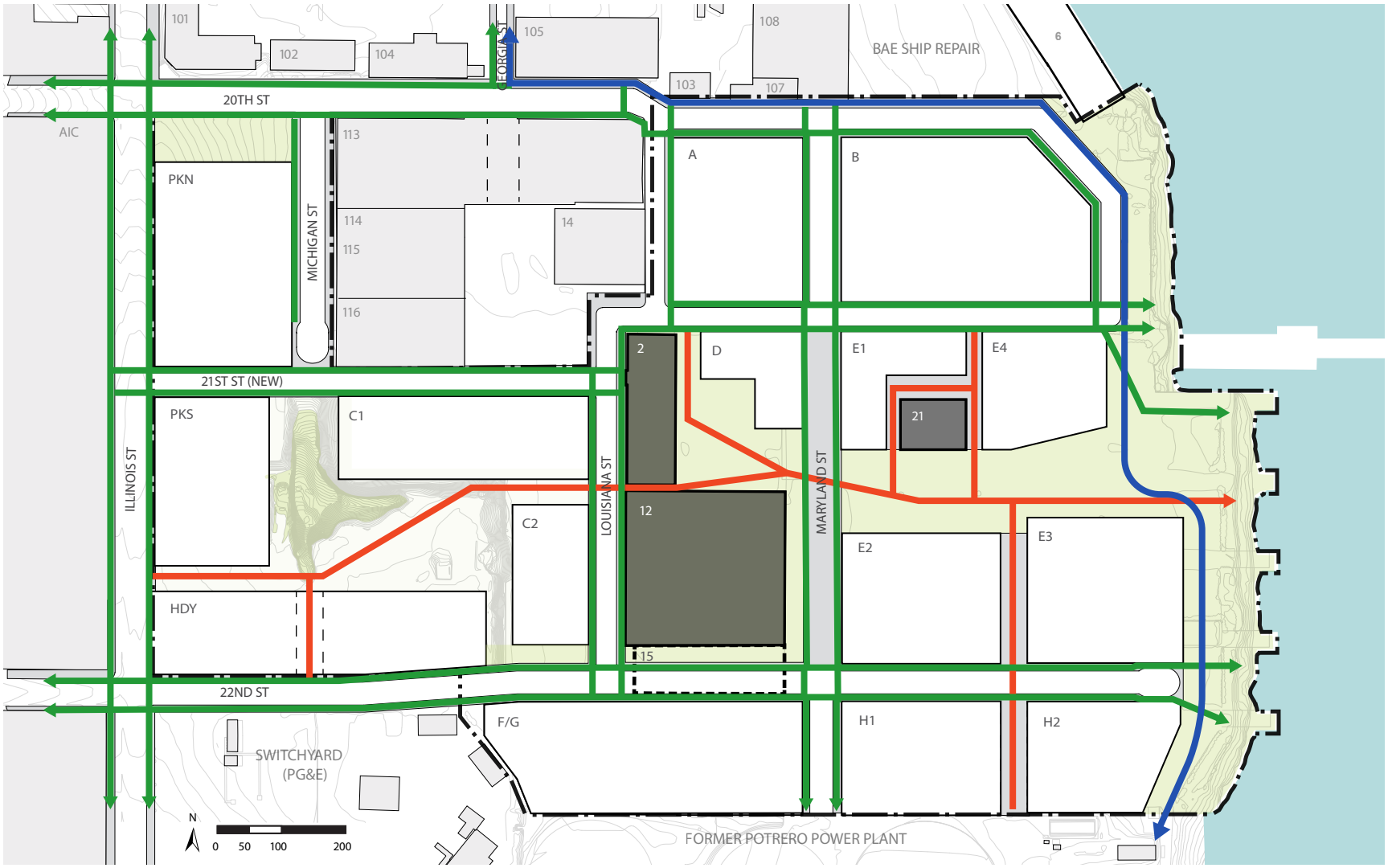


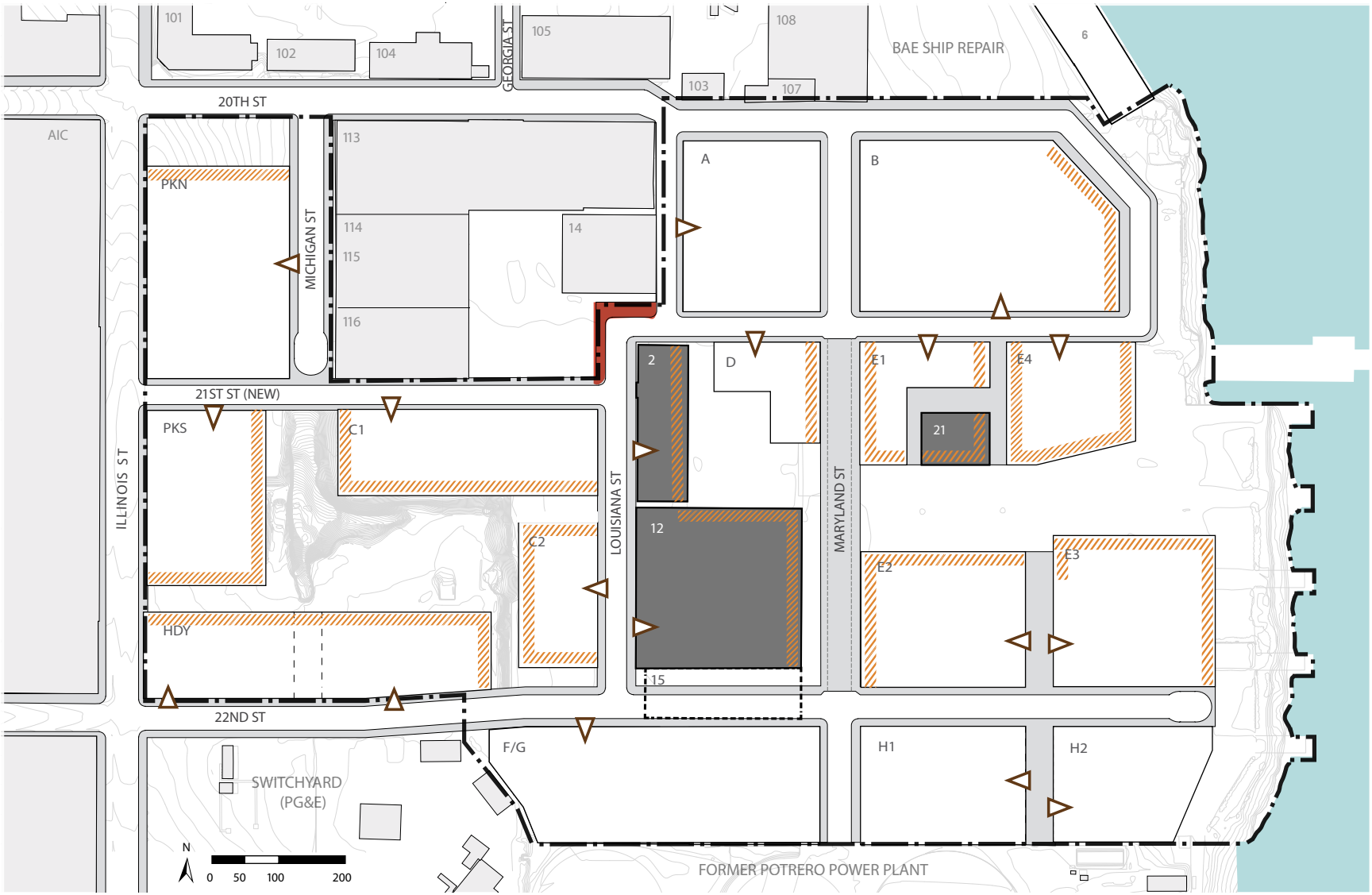
Figure 2G

Proposed Project Site Pedestrian Network

1.2.7 Loading Supply

The Proposed Project site loading locations are presented in **Figure 2H**. These locations are conceptual and subject to change; these will be designed in detail as the project is approved on a block by block level. Within the Proposed Project site, Michigan Street, Louisiana Street, and 21st Street would be designed as primary on-street loading corridors, with heavy loading (trucks up to 40 feet long) accommodated at Michigan Street and Louisiana Street near the Historic Core. Based on the Proposed Project's loading guidelines in the Design for Development and Special Use District, loading spaces would be required for each use based the square footage and use of the buildings. All residential buildings less than 225,000 square feet would have one loading space, while residential buildings greater than 225,000 square feet would have two loading spaces. Arts/light industrial buildings with more than 50,000 gross square feet of leasable area (GLA) would have one to two loading spaces (one space for buildings between 50,000 and 150,000 square feet of GLA and two spaces for buildings larger than 150,000 square feet of GLA). Retail spaces between 10,000 and 30,000 square feet of GLA would have one on-street loading space while spaces greater than 30,000 square feet of GLA would have two off-street spaces plus one additional off-street space for every 25,000 square feet of GLA over 50,000.. Commercial/office buildings with under 50,000 square feet of gross leasable area would not be required to provide loading spaces; between 50,001 and 100,000 square feet, one on-street loading space would be required; between 100,001 and 250,000 square feet, one off-street loading space would be required; between 250,001 and 500,000 square feet, two off-street loading spaces would be required; and over 500,000 square feet, three off-street loading spaces would be required. On-street loading spaces would be able to accommodate WB-40 vehicles and would be a minimum of 75 feet long. Off-street loading spaces would be a minimum of 12 feet wide and 35 feet long.

For the Maximum Residential Scenario, a total of 28 loading spaces would be provided. For the Maximum Commercial Scenario, a total of 25 loading spaces would be provided. Final design of loading spaces will be determined by the Proposed Project's final buildout.



Note: This figure is conceptual and loading locations are subject to change.

Protected Edge - No Parking and Loading Entrances

Zone for Potential Mountable Curb

Recommended Loading Access Points

Figure 2H

Proposed Project Site Loading Locations

1.2.8 Transportation Demand Management (TDM) Plan

The Proposed Project includes a Transportation Demand Management Plan that provides a comprehensive strategy to manage the transportation demands created by the Proposed Project. The TDM Plan incorporates transportation planning principles to address the transportation needs of the Proposed Project consistent with the City of San Francisco's Transit First, Better Streets, Climate Action and Transportation Sustainability Plans and Policies, to encourage use of transit and other modes of transportation and discourage use of single occupancy automobiles or automobiles in general.

These strategies include:

- Transportation Management Association (TMA). The Proposed Project's TDM program would be administered and maintained by a transportation management association. The TMA for the Proposed Project would be responsible for working with future subtenants of the site (e.g., employers, residents, etc.) to ensure that they are actively participating in the TDM program. Upon agreeing to lease property at the Proposed Project site, these subtenants would become "members" of the TMA and able to take advantage of the TDM program services provided through the TMA. The TMA would be led by a Board of Directors which would be staffed by representatives from diverse stakeholders that would include the Port (as the current property owner) and the SFMTA (as the public agency responsible for oversight of transportation in the City), and could include representatives of various buildings that have been constructed at the site. The Board of Directors may also include representatives from commercial office tenants or homeowners' associations.

- On-Site Transportation Coordinator. Day-to-day operations of the TMA would be handled by a staff who would work under the high-level direction provided by the Board of Directors. The lead staff position would serve as the on-site Transportation Coordinator, functioning as the TMA's liaison with subtenants in the implementation of the TDM program and as the TMA's representative in discussions with the City. Duties would include operation of the TMA website and ridematching services, distribution of transportation information packets, preparation of TDM plans for large special events, development and management of a rewards program for employees who do not drive on their commute, monitoring and reporting, and management of the Proposed Project shuttle service.

- Shuttle service. The shuttle would connect residents and workers to transit hubs throughout San Francisco. The TMA would provide this service through a contractual agreement with a third-party shuttle operator, similar to other existing shuttle services. The TMA would be responsible for devising the proposed service plan. The TMA would lead coordination with SFMTA transit services planning to ensure delivery of an efficient plan that is not redundant with or does not interfere with existing public transit. Shuttle service is not intended or anticipated to replace or duplicate Muni service for local trips.

- Bikesharing stations to serve the Proposed Project. The TMA would work collaboratively with SFMTA and Bay Area Bike Share (BABS) representatives on finalizing the design, location, installation timeline, and funding arrangements for both initial installation and ongoing operation and maintenance of any proposed bikesharing station, if the established BABS program expands into the surrounding area.

- Supplementary components. Tenant and visitor amenities would include the provision of real-time transit data in building lobbies or other locations; transit information kiosks with maps, fare tables, commuter

benefits guides, and wayfinding devices; real-time occupancy data for shared parking facilities; on-street carshare spaces; preferential treatment for high-occupancy vehicles; and unbundled parking for residents.

In addition to the day-to-day TDM measures included as part of the Proposed Project, additional strategies may be appropriate for special events held at Pier 70. Currently, the Pier 70 site hosts occasional large events with attendance levels up to 40,000 people. These events typically occur outside of the traditional peak periods for analysis, but at times, create localized congestion around the Pier 70 site.

For these larger events, the event sponsor must obtain special permits from the Port of San Francisco, and, if required, the City. As part of the permitting process, the event sponsor must include a plan for managing travel to and from the event safely and with minimal effect on the surrounding neighborhoods. These management strategies may include special event shuttles, promotion of transit services, and parking management, such as valet parking.

Although the Proposed Project is not being designed as an event venue, it is possible some events may still be held on the site, although they would not likely be as large as some of the larger events currently held at the site. As with how things operate under existing conditions, events at the Pier 70 site would continue to require City permits and event organizers would continue to develop event-specific TDM Plans to ensure that the flow of people into and out of the site would be managed similarly to current conditions.

It is important to note that while these measures are proposed as part of the Proposed Project, no attempt has been made to quantify the effectiveness of specific measures in terms of trip generation in the analysis.

This report includes two sets of proposed TDM measures, including 1) those that are part of the Proposed Project (i.e., those described above), and 2) those that are identified as Potential Measures and go beyond the strategies summarized above.

1.3 REPORT ORGANIZATION

The remainder of this report is divided into the following chapters:

Chapter 2 – Existing Conditions describes the Proposed Project study area, public transit network, bicycle facilities, pedestrian facilities, existing loading operations, and emergency service activity and access.

Chapter 3 – Baseline Conditions describes changes to Existing Conditions as a result of land use and transportation changes near the Proposed Project study area that were approved or under construction at the time of the Notice of Preparation (NOP), dated May 6, 2015.

Typically, transportation analyses include an Existing and an Existing plus Project analysis to isolate the impacts associated with a project by comparing conditions with the proposed project in place to the existing baseline. However, in select circumstances, it may be appropriate to establish a different baseline than existing conditions, particularly in cases where comparison to the existing conditions may provide misleading information or information that does not provide value to the public or to decision-makers. The analysis in Chapter 5, Project Impact Analysis, includes Existing Conditions results and data for informational purposes only. The Proposed Project's impacts in Chapter 5 are determined by adding the Project to the Baseline Conditions described in Chapter 3 and comparing the Plus Project scenario to these results.

Chapter 4 – Travel Demand Analysis includes the Proposed Project's trip generation, trip distribution, mode split, and trip assignment forecasts for private vehicles, as well as taxi, shuttle bus, transit, bicycle, pedestrian, and loading travel demand for the two Proposed Project scenarios described earlier.

Chapter 5 – Project Impact Analysis describes the anticipated operating conditions of the transportation network with the Proposed Project in place and identifies the extent to which Proposed Project travel demand would impact the transportation network.

Baseline Plus Project Conditions describes the anticipated operating conditions of the transportation network assuming full operation of the Proposed Project as well as travel demand associated with other approved or under construction projects as of the date of the NOP. Operations of the transportation network after the addition of the travel demand from the Proposed Project and other relevant projects are described, including the Proposed Project's impacts on transit, bicycles, pedestrians, loading, emergency vehicles, and the potential impacts of the Project construction on the transportation network. Vehicle-Miles Traveled forecasts are presented to indicate the total increase in vehicle miles traveled (VMT) due to the Proposed Project and if the VMT from the Proposed Project would exceed the City's standard. This section also includes a brief discussion of the Proposed Project's parking supply in relation to its forecasted demand.

Chapter 6 – Cumulative 2040 Conditions describes the anticipated operating conditions of the transportation network with the Proposed Project and other reasonably foreseeable development projects and transportation investments through the year 2040. The Proposed Project's contribution to future transit ridership and associated cumulative impacts in the area is described.

Chapter 7 – Intersection and Freeway Operations Analysis describes the operating conditions of the existing transportation network in the Proposed Project study area for vehicles, including the surrounding roadway network, for a typical weekday AM peak hour and PM peak hour. This is done for Existing Conditions, Baseline Conditions (including the approved and under construction projects in the area), Baseline Plus Project Conditions, and for Cumulative Conditions, in which future year traffic forecasts without the Proposed Project were estimated using the San Francisco County Transportation Authority's travel demand model, SF-CHAMP. The Proposed Project's contribution to future traffic growth in the area is described.

Because intersection and freeway traffic operations are no longer considered a significant impact, this information is provided for informational discussion purposes only. Potential measures to address congestion are noted for each location that incurs what would previously have been designated a significant impact based on the City's previous impact criteria.

Chapter 8 – Parking Conditions summarizes the Proposed Project's forecasted peak parking demand and proposed parking supply. Similar to intersection and freeway operations, parking shortfalls are not considered a significant impact and this information is provided for discussion purposes only.

Chapter 9 – Transportation Mitigation and Potential Measures summarizes the proposed mitigation measures identified to reduce significant transportation impacts that may be created by the Proposed Project. In addition, potential measures are provided in cases where Proposed Project impacts are less-than-significant but measures to improve circulation or Proposed Project access may be beneficial.

2 EXISTING CONDITIONS

This chapter provides a description of the existing transportation and circulation setting within the vicinity of the Proposed Project, as well as conditions with approved and under construction projects in the area. This section includes descriptions of the existing roadway network, transit network and service, pedestrian and bicycle conditions, on-street loading and emergency access.

2.1 ELEMENTS OF ANALYSIS

The study examines existing facilities and conditions related to the following transportation elements:

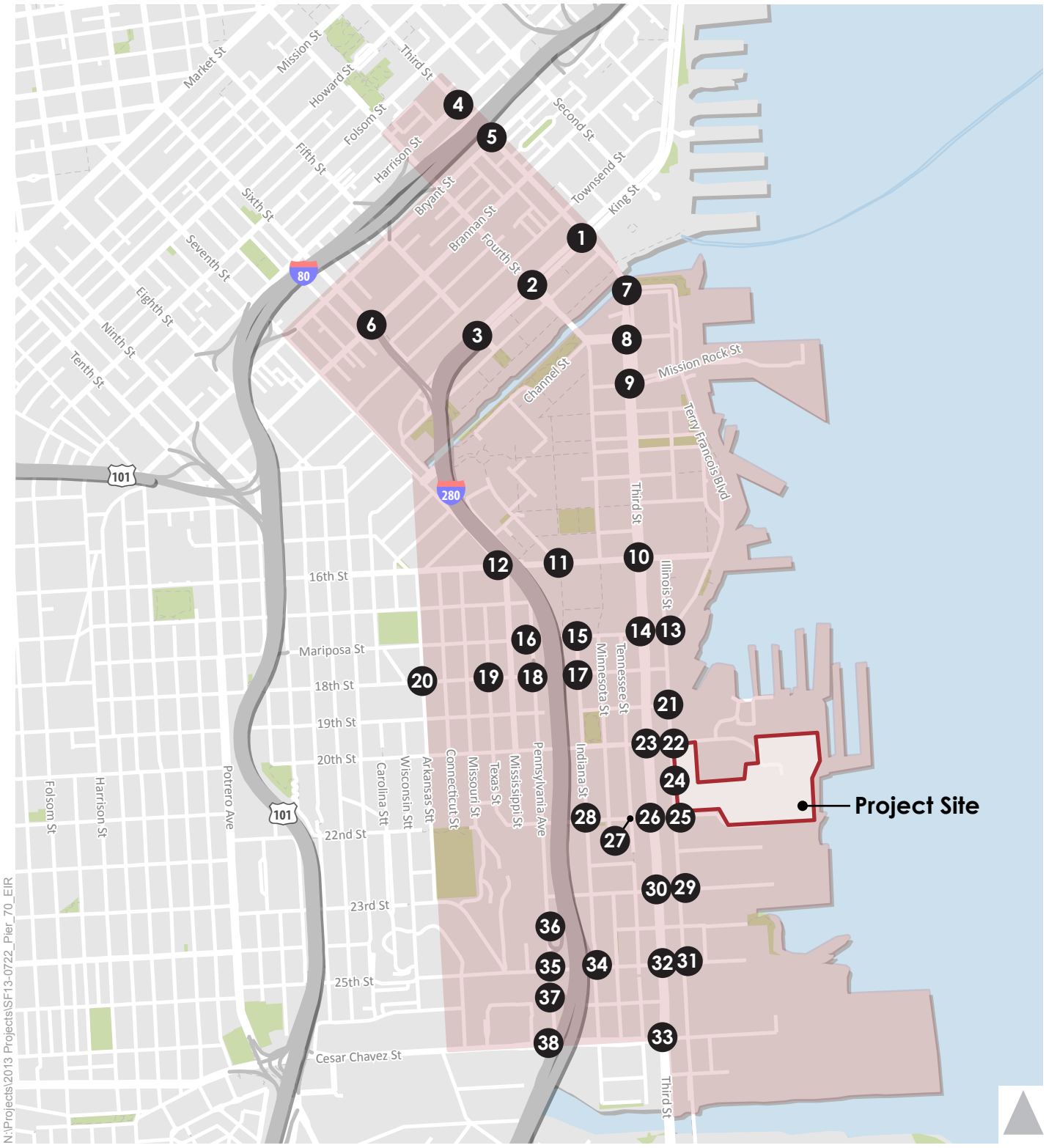
- Transit Conditions – Muni and regional transit operations affected by the Proposed Project;
- Pedestrian and Bicycle Conditions – operations along facilities through the study area;
- Loading and Emergency Service Conditions – operations within the study area; and
- Parking Conditions – characterization of supply and demand throughout the study area, generally near the Proposed Project site;
- Traffic Conditions – vehicle-miles traveled (VMT) generated by the Proposed Project.

2.2 TRANSPORTATION STUDY AREA

The transportation study area includes all aspects of the transportation network that may be measurably affected by Proposed Project trips. The transportation study area is defined by travel corridors and by facilities such as transit stations, freeway segments, freeway ramps and existing and proposed street intersections that residents and visitors would use in traveling to and from the Proposed Project. The study area was shown in **Figure 1**.

The study area is located on the eastern shoreline of San Francisco and is generally bounded by the San Francisco Bay, Third Street (north of Mariposa Street), and Illinois Street (south of Mariposa Street) to the east, Harrison Street and Bryant Street to the north, Seventh Street and Arkansas Street to the west, and Cesar Chavez Street to the south. The study area also includes the Proposed Project site, extending west from Illinois Street to the waterfront between 20th Street and 22nd Street. The Proposed Project site is located near some major destinations including the University of California, San Francisco Mission Bay Medical Center and AT&T Park.

A total of 37 existing intersections (38 under conditions with the Proposed Project) and eight freeway segments within the study area were identified as key locations that are likely to be affected by the Proposed Project, and were selected for detailed study. The study intersections include all major intersections along Third Street, Illinois Street, 25th Street, Mariposa Street, and 16th Street, as well as access routes to and from US-101 and I-280 within the study area. Roadways and intersections farther from the Proposed Project were not analyzed as part of the study, as Proposed Project traffic remaining on local streets would be dispersed and consequently, the Proposed Project contribution would be less than at the study intersections. **Figure 3** presents the traffic analysis locations.



Study Intersection

Study Area

Figure 3

Study Intersections

2.3 ROADWAY FACILITIES



This section describes the regional and local roadway system in the study area. Roadway classification definitions, according to the Transportation Element of the *San Francisco General Plan*, are contained in **Appendix C.**

2.3.1 Regional Access

Regional access to the Proposed Project study area is provided by several major regional freeways, as discussed below.

Interstate 80 (I-80) provides the primary regional access to the Proposed Project site from the East Bay. I-80 runs through the northern portion of the study area and connects San Francisco to the East Bay and other points east via the San Francisco-Oakland Bay Bridge. I-80 eastbound can be accessed via the on-ramp at Fifth Street/Bryant Street, and the Proposed Project can be accessed from westbound I-80 at the off-ramp at Fifth Street/Harrison Street. Within the study area, I-80 has six lanes (three in each direction).

Interstate 280 (I-280) provides regional access to the study area from the South Bay and Peninsula. I-280 and U.S. 101 have an interchange to the south of the study area, and I-280 terminates in the study area at the King and Fifth street intersection. I-280 is generally a six-lane freeway. The Proposed Project can be accessed from either Mariposa Street or Cesar Chavez Street off-ramps in the northbound direction, or the 18th Street or Cesar Chavez Street off-ramps in the southbound direction. The nearest on-ramps are from 25th Street or 18th Street in the northbound direction and Mariposa Street and Pennsylvania/25th Street in the southbound direction.

U.S. Highway 101 (U.S. 101) provides access to the north and south of the study area. U.S. 101 is to the west of the study area and provides access to the Peninsula and South Bay. U.S. 101 connects with I-80 and the San Francisco–Oakland Bay Bridge to the northeast of the Proposed Project site. U.S. 101 also connects San Francisco and the North Bay via the Golden Gate Bridge, via surface streets (i.e., Van Ness Avenue and Lombard Street). Van Ness Avenue and Lombard Street are part of the Citywide Pedestrian Network outlined in the Transportation Element of the *San Francisco General Plan*.

2.3.2 Local Access

Local access to the Proposed Project study area is provided by an urban street grid network. Key local roadways through the study area are summarized in **Table 4**.

TABLE 4: LOCAL ROADWAY NETWORK DESCRIPTIONS

Street Name	Direction	Lanes (typ.)	General Plan Designation [1]	Transit Routes [1]	Bicycle Facilities / Routes (typ.) [1, 2]
Third Street	N-S	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Primary Transit Important Preferential Street Citywide Pedestrian Network Street Neighborhood Commercial Pedestrian Street Near-Term Bicycle Improvement Projects & Minor Improvements to Bicycle Route Network	8X, 8AX, 8BX, 9, 30, 45, 55, 81X, T	Class III [3]
Fourth Street	N-S	2/4 [4]	Congestion Management Network Major Arterial Metropolitan Transportation System Street Primary Transit Important Preferential Street Citywide Pedestrian Network Street Neighborhood Commercial Pedestrian Street & Minor Improvements to Bicycle Route Network	47	Class II
Fifth Street	N-S	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Near-Term Bicycle Improvement Projects	8X, 8AX, 8BX, 27, 30, 45, 47	Class III, Route 19
Sixth Street	N-S	6 [5]	Congestion Management Network Major Arterial Metropolitan Transportation System Street Neighborhood Commercial Pedestrian Street	14X, 27	-
Seventh Street	N-S	2-4 [6]	Congestion Management Network Major Arterial Metropolitan Transportation System Street	19	Class II, Route 23
16th Street	E-W	4	Primary Transit Oriented Preferential Street Neighborhood Commercial Pedestrian Street Near-Term Bicycle Improvement Projects	22, 33, 55	Class II, Route 40
18th Street	E-W	2 [7]	Neighborhood Commercial Pedestrian Street (section)	22	-
19th Street	E-W	2	-	-	-
20th Street	E-W	2	Neighborhood Commercial Pedestrian Street (section)	22, 48	-
21st Street (future only)	E-W	2	-	-	-
22nd Street	E-W	2	-	48	-
23rd Street	E-W	2	-	10, 19, 48	-
25th Street	E-W	2	-	10, 48	-
Arkansas Street	N-S	2	-	10	-
Brannan Street	E-W	2/4 [8]	-	82X, 83X	-
Bryant Street	E-W	2-5 [9]	Primary Transit Important/Secondary Transit Preferential Street Neighborhood Commercial Pedestrian Street	8, 8AX, 8BX, 27, 47	-

TABLE 4: LOCAL ROADWAY NETWORK DESCRIPTIONS					
Street Name	Direction	Lanes (typ.)	General Plan Designation [1]	Transit Routes [1]	Bicycle Facilities / Routes (typ.) [1, 2]
Cesar Chavez Street	E-W	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Near-Term Bicycle Improvement Projects	-	Class II, Route 60
Channel Street	E-W	2/4 [10]	-	-	-
Harrison Street	E-W	4-5	Congestion Management Network Major Arterial Primary Transit Important/Secondary Transit Preferential Street Neighborhood Commercial Pedestrian Street	12, 27, 47	-
Illinois Street	N-S	2	-	48	Class II, Route 5
Indiana Street	N-S	2	Minor Improvements to Bicycle Route Network	-	Class III, Route 7
King Street	E-W	4	Congestion Management Network Major Arterial Metropolitan Transportation System Street Primary Transit Important Preferential Street Neighborhood Pedestrian Network Connection Street	N, T	Class II/Class III, Route 5
Mariposa Street	E-W	2/4 [11]	-	-	Class III, Route 7/23
Mission Rock Street	E-W	2 [12]	-	-	-
Mississippi Street	N-S	2	-	-	Class II [13]
Owens Street	N-S	4	-	-	-
Pennsylvania Street	N-S	2	-	48	-
Tennessee Street	N-S	2	-	22	-
Terry A. Francois Blvd.	N-S	4	-	-	Class II, Route 5
Texas Street	N-S	2	-	-	-

Notes:

1 The descriptions associated with each street (General Plan Designation, Transit Routes, etc.) are those that apply to some portion of that street, although not necessarily the entire length of that street.

2 Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles. Class III bikeways are signed bike routes that allow bicycles to share the travel lane with vehicles. See Section 2.7 for additional discussion.

3 Except between China Basin Street and Cesar Chavez Street where there are no bicycle facilities.

4 Two lanes from 16th Street to Channel Street; four lanes north of Channel Street, except six lanes from King Street to Townsend Street.

5 Four lanes from Market Street to Howard Street; Five lanes (three northbound, two southbound) from Howard Street to Folsom Street during peak periods only (four lanes during other times); Six lanes during peak periods only from Folsom Street to Brannan Street (four lanes during other times)

6 Two lanes from 16th Street to King Street; three lanes from King Street to Brannan Street; four lanes north of Brannan Street.

7 Two lanes except between Minnesota Street and Pennsylvania Avenue where there are three lanes and an additional westbound right-turn lane onto the I-280 freeway.

8 Two lanes from The Embarcadero to Colin P Kelly Jr Street; four lanes southwest of Colin P Kelly Jr Street.

9 Five lanes from 7th Street to 2nd Street; three lanes from 2nd Street to Interstate 80 (I-80) ramp; two lanes from I-80 ramp to Beale Street; three lanes from Beale Street to The Embarcadero.

TABLE 4: LOCAL ROADWAY NETWORK DESCRIPTIONS

Street Name	Direction	Lanes (typ.)	General Plan Designation [1]	Transit Routes [1]	Bicycle Facilities / Routes (typ.) [1, 2]
10	Four lanes from 3rd Street to 4th Street; two lanes elsewhere.				
11	Four lanes from Terry A Francois Boulevard to Pennsylvania Avenue; two lanes elsewhere.				
12	Six lanes at intersection with Terry A Francois Boulevard.				
13	Class II bicycle facility from 16th Street to Mariposa Street; no bicycle facilities elsewhere.				

Source: Fehr & Peers, 2015, San Francisco General Plan.

2.4 TRANSIT NETWORK



The Proposed Project study area is well-served by public transit, both local and regional. Local service is provided by the San Francisco Municipal Railway (Muni) bus and light rail lines, which can be used to access regional transit operators. Service to and from the East Bay is provided by Bay Area Rapid Transit (BART), AC Transit and possibly ferries; service to and from the North Bay is provided by Golden Gate Transit buses and ferries; service to and from the Peninsula and South Bay is provided by SamTrans, BART, and Caltrain. **Figure 4** presents the transit routes in the vicinity of the Proposed Project study area.

2.4.1 San Francisco Muni

Muni provides transit service within the City and County of San Francisco, including bus (both diesel and electric trolley), light rail (Muni Metro), cable car and electric streetcar lines. Muni operates a number of bus and rail lines in the Proposed Project study area. **Table 5** presents the Muni routes serving the transit study area and route characteristics as of March 2015, including service frequencies during the weekday morning and evening peak periods, hours of operations and neighborhoods served. There are existing Muni stops in both directions at Third Street and 20th Street.

TABLE 5: LOCAL MUNI OPERATIONS				
Route	AM Peak Weekday Headways (7AM-9AM)[1]	PM Peak Weekday Headways (4PM-6PM)[1]	Hours of Operation	Neighborhoods Served by Route
T Third	9	9	4:00AM – 1:30AM	Balboa Park, Market Street, Visitacion Valley
10 Townsend	15	20	5:00AM – 12:30AM	Potrero Hill, China Basin, Financial District, Pacific Heights
19 Polk	15	15	5:00AM – 1:30AM	Hunter's Point, Mission, SoMa, Nob Hill
22 Fillmore	9	8	24 hours per day	Marina, Fillmore, Portrero Hill
48 Quintara / 24th Street	10	12	24 hours per day	SoMa, Mission, Sunset
55 16th Street[2]	15	15	6:00AM – 12:00AM	Mission District, Mission Bay, Potrero Hill

Notes:

1. Headway is scheduled time between buses, presented in minutes.
2. As discussed later in this report, the 55 16th Street is a relatively new, interim route designed to provide service along 16th Street until the 22 Fillmore is extended into Mission Bay. The Proposed Project's impact analysis is based on conditions after the 22 Fillmore extension is complete; therefore, no additional discussion of ridership data for the 55 16th Street is provided in this section.

Source: SF Muni, 2015; Prepared by Fehr & Peers, 2015.

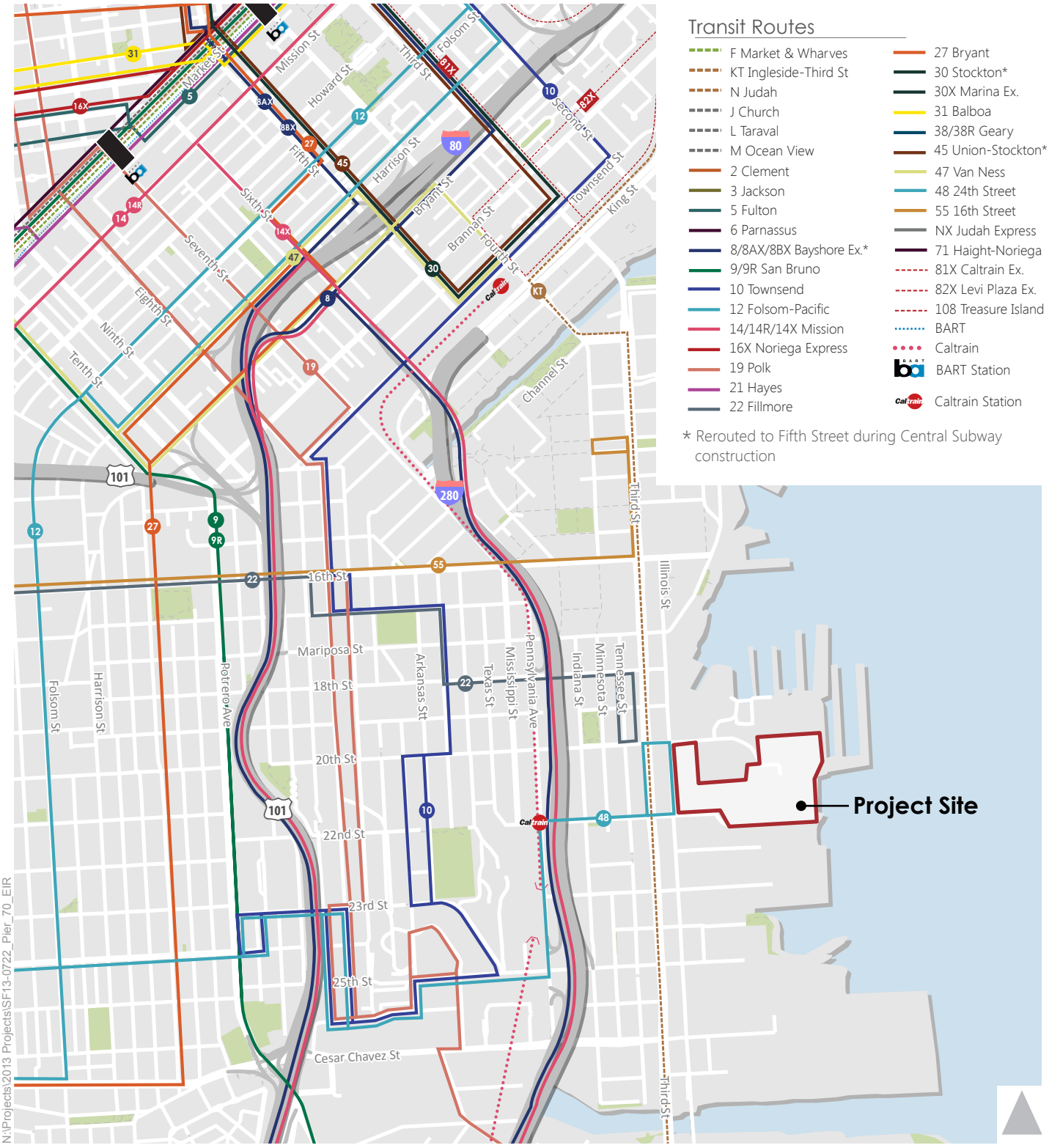


Figure 4

Existing Transit Network

2.4.1.1 Existing Muni Ridership Data

Transit operations in the study area were evaluated using two methods. First, existing ridership data for the lines providing direct access to the Proposed Project were analyzed based on each line's peak capacity utilization at its maximum load point ("MLP"), obtained from the SFMTA's automated passenger count (APC) database in September/October 2013. This is the most current data available for this analysis. In addition, the study included a directional analysis that can be used to determine if certain screenline approaches between the Proposed Project study area and Downtown San Francisco have adequate capacity to serve demand. These screenlines are defined in the *SF Guidelines*. Transit Line capacity calculation sheets are provided in **Appendix D**.

2.4.1.2 Capacity Utilization by Line

AM and PM peak hour capacity utilization was determined at the MLP for each route serving the Proposed Project study area. The MLP is the location where the route has its highest number of passengers relative to its capacity. Capacity utilization relates the number of passengers per transit vehicle to the design capacity of the vehicle. The capacity per vehicle includes both seated and standing capacity, where standing capacity is between 30 to 80 percent of seated capacity (depending upon the specific transit vehicle configuration). The capacity of a light rail vehicle is 119 passengers, the capacity of a historic streetcar is 70 passengers, and the capacity of a standard bus is 63 passengers. The SFMTA Board has adopted an 85 percent capacity utilization performance standard for transit vehicle loads. It should be noted that the 85 percent utilization is of seated and standing loads, so at 85 percent all seats are taken, and there are many standees. The Planning Department has similarly utilized the 85 percent capacity utilization standard as threshold of significance for determining peak period transit demand impacts to the SFMTA lines. For all regional transit operators, the capacity is based on the number of seated passengers per vehicle. All of the regional transit operators have a one-hour load factor standard of 100 percent, which would indicate that all seats are full. As a result, the Planning Department uses 100 percent capacity utilization as a threshold of significance for determining peak period transit demand impacts to regional transit.

Table 6 outlines the AM and PM peak ridership and capacities at maximum load points for transit lines in the study area. One Muni route (10 Townsend) records passenger loads that exceed 85 percent capacity utilization, which is SFMTA's standard maximum acceptable utilization. Passenger loads range from 39 percent (KT Third/Ingleside Inbound – AM Peak Hour) to 90 percent (10 Townsend Inbound – AM Peak Hour) of capacity. Immediately adjacent to the study area, capacity utilization is generally lower than the utilization at the MLP.

TABLE 6: MUNI PEAK HOUR LOAD AND CAPACITY UTILIZATION BY LINE

Route	Maximum Load Point	Passenger Load[1]	Peak Hour Capacity[2]	Capacity Utilization
AM				
T Third (IB)[3]	Van Ness	381	793	48%
T Third (OB)	Embarcadero / Folsom Street	310	793	39%
10 Townsend (IB)	Second Street / Townsend Street	244	270	**90%**
10 Townsend (OB)	Pacific Avenue / Mason Street	208	252	82%
19 Polk (IB)	Larking Street / O'Farrell Street	188	252	75%
19 Polk (OB)	Eighth Street / Howard Street	160	252	63%
22 Fillmore (IB)	16th Street / Guerrero Street	293	420	70%
22 Fillmore (OB)	16th Street / Mission Street	267	420	63%
48 Quintara/24th Street (IB)	24th Street / Guerrero Street	221	302	73%
48 Quintara/24th Street (OB)	24th Street / Folsom Street	245	315	77%
PM				
T Third (IB)	Embarcadero / Harrison Street	314	793	40%
T Third (OB)	Embarcadero / Harrison Street	550	793	69%
10 Townsend (IB)	Pacific Street / Stockton Street	168	189	**88%**
10 Townsend (OB)	Second Street / Townsend Street	153	189	80%
19 Polk (IB)	Seventh Street / Howard Street	180	252	71%
19 Polk (OB)	Eighth Street / Mission Street	168	252	66%
22 Fillmore (IB)	16th Street / Folsom Street	293	473	61%
22 Fillmore (OB)	Fillmore Street / Grove Street	278	473	58%
48 Quintara/24th Street (IB)	24th Street / Mission Street	180	315	57%
48 Quintara/24th Street (OB	24th Street / Folsom Street	205	315	65%

Notes:
Bold indicates capacity utilization of 85 percent or greater. Outbound and inbound capacities for the same route may be different due to different headways or vehicle type.
1. Peak hour ridership.
2. Total peak period capacity in passengers per hour.
3. Ridership for the KT Ingleside/Third reflects MLP between project site and Market Street. Actual MLP for the entire route may occur past Market Street; however, most project-related trips on this route would be traveling to destinations along Market Street.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015.

2.4.1.3 Downtown Screenlines

The availability of Muni service capacity was also analyzed in terms of a series of screenlines. The concept of screenlines is used to describe the magnitude of travel to or from the greater downtown area and to compare estimated transit volumes to available capacities. Screenlines are hypothetical lines that would be crossed by persons traveling between downtown and its vicinity (Superdistrict 1) to or from other parts of San Francisco and the region (Superdistricts 2, 3 and 4). Four screenlines have been established in downtown San Francisco to analyze potential impacts of projects on Muni service: northeast, northwest, southwest, and southeast, with sub-corridors within each screenline. The bus and light rail lines used in this screenline analysis are considered the major commute routes from the downtown area. Other bus lines, such as lines with greater than ten-minute headways are not included, due to their generally lower ridership. Transit serving the Proposed Project study area crosses all four downtown screenlines. **Table** shows Muni routes by downtown screenline grouping. Additionally, the 22 Fillmore, 48 Quintara/24th Street, and T Third Light Rail will be analyzed individually.

TABLE 7: MUNI DOWNTOWN SCREENLINE GROUPINGS	
Northeast	
Kearny/Stockton	8 Bayshore 30 Stockton 30X Marina Express 41 Union 45 Union-Stockton
Other lines	E Embarcadero F Market & Wharves 10 Townsend 12 Folsom Pacific
Northwest	
Geary	38 Geary 38R Geary Rapid 38AX Geary 'A' Express 38BX Geary 'B' Express
California	1 California 1AX California 'A' Express 1BX California 'B' Express
Sutter/Clement	2 Clement
Fulton/Hayes	5 Fulton 5R Fulton Rapid 21 Hayes
Balboa	31 Balboa 31AX Balboa 'A' Express 31BX Balboa 'B' Express
Southeast	
Third Street	T Third Street
Mission	14 Mission 14R Mission Rapid 14X Mission Express 49 Van Ness-Mission
San Bruno/Bayshore	8 Bayshore 8AX Bayshore 'A' Express 8BX Bayshore 'B' Express 9 San Bruno 9R San Bruno Rapid
Other lines	J Church 10 Townsend 19 Polk 27 Bryant
Southwest	

TABLE 7: MUNI DOWNTOWN SCREENLINE GROUPINGS	
Subway lines	K Ingleside L Taraval M Ocean View N Judah
Haight/Noriega	6 Haight/Parnassus 7 Height-Noriega 7R Haight-Noriega Rapid 7X Noriega Express NX Judah Express
Other lines	F Market & Wharves

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015.

Table 8 presents the existing ridership and capacity utilization at the MLP for the routes crossing the downtown screenlines during the weekday AM and PM peak hours. The capacity utilization calculation in the inbound direction uses AM data and in the outbound direction PM data to align with the peak directions of travel and patronage loads for the Muni system to or from the downtown area during those periods. The Proposed Project is located outside of the Downtown Screenlines. Because of the high amount of non-residential uses, it is expected that many of the trips would be towards the Proposed Project in the AM and away from the Proposed Project in the PM. This directionality is counter to the direction in which Downtown Screenlines are assessed. Therefore, it is likely that most transit trips would not travel through the maximum load point, and instead travel through portions of the route where capacity is available. As shown in **Table 8,** all screenlines operate below Muni's 85 percent capacity utilization standard, except for the southwest screenline in the AM peak (as a result of 102 percent utilization on the subway lines subcorridor). A small number of other subcorridors exceed the capacity utilization standard; however, the screenelines in which they operate do not exceed the standard. Therefore, conditions are considered acceptable on these screenlines. Because of the more balanced directionality of project trips, the three Muni routes that are analyzed individually are analyzed for both the inbound and outbound directions.

TABLE 8: MUNI DOWNTOWN SCREENLINES AND PROJECT-SPECIFIC LINES – EXISTING CONDITIONS

Screenline	AM Peak Hour (Inbound)			PM Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
Northeast						
Kearny/Stockton	2,211	3,050	73%	2,245	3,327	68%
Other lines	538	1,141	47%	683	1,078	63%
Screenline Total	*2,749*	*4,191*	*66%*	*2,928*	*4,405*	*67%*
Northwest						
Geary	1,821	2,490	73%	1,964	2,623	75%
California	1,610	2,010	80%	1,322	1,752	75%
Sutter/Clement	480	630	76%	425	630	68%
Fulton/Hayes	1,277	1,680	76%	1,184	1,323	**90%**
Balboa	758	1,019	74%	625	974	64%
Screenline Total	*5,946*	*7,828*	*76%*	*5,519*	*7,302*	*76%*
Southeast						
Third Street	350	793	44%	782	793	**99%**
Mission	1,643	2,509	66%	1,407	2,601	54%
San Bruno/Bayshore	1,689	2,134	79%	1,536	2,134	72%
Other lines	1,466	1,756	84%	1,084	1,675	65%
Screenline Total	*5,147*	*7,193*	*72%*	*4,810*	*7,203*	*67%*
Southwest						
Subway lines	6,330	6,205	**102%**	4,904	6,164	80%
Haight/Noriega	1,121	1,554	72%	977	1,554	63%
Other lines	465	700	67%	555	700	79%
Screenline Total	*7,916*	*8,459*	***94%***	*6,435*	*8,418*	*77%*
Muni Screenlines Total	*21,758*	*27,671*	*79%*	*19,693*	*27,328*	*72%*
Individual Muni Routes						
22 Fillmore (IB)	293	420	70%	293	473	62%
22 Fillmore (OB)	267	420	64%	278	473	59%
48 Quintara/24th Street (IB)	221	302	73%	180	315	57%
48 Quintara/24th Street (OB)	245	315	78%	205	315	65%
KT Ingleside/Third (IB)	381	793	48%	314	793	40%
KT Ingleside/Third (OB)	310	793	39%	550	793	69%

Notes:

Bold indicates capacity utilization of 85 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. See Appendix D for Transit Line Capacity Calculations.

2.4.2 Regional Transit Service

In addition to Muni operations, regional transit service was considered. The following regional transit services operate within San Francisco and are accessible from the study area via Muni or by walking or bicycling. **Table 9** presents the regional transit routes serving the transit study area and route characteristics as of May 2015, including service frequencies during the weekday morning and evening peak periods, hours of operations and neighborhoods served.

Caltrain

Caltrain provides passenger rail service on the Peninsula between San Francisco and Downtown San Jose with several stops in San Mateo County and Santa Clara County. Limited service is available south of San Jose. Caltrain service headways during the AM and PM peak periods are 10 to 60 minutes, depending on the type of train. The peak direction of service is southbound during the AM peak period and northbound during the PM peak period. Caltrain service terminates at the San Francisco Station at King/Fourth. In the study area, there is a Caltrain station on 22nd Street between Indiana Street and Pennsylvania Avenue. Both stations are served by local, limited, and express "Baby Bullet" trains.

Bay Area Rapid Transit (BART)

BART provides regional commuter rail service between San Francisco and the East Bay (Pittsburg/Bay Point, Richmond, Dublin/Pleasanton and Fremont), as well as between San Francisco and San Mateo County (SFO Airport and Millbrae). Weekday hours of operation are between 4 AM and midnight. During the weekday PM peak period, headways are five to 15 minutes along each line. Within San Francisco, BART operates underground along Market Street to Civic Center Station where it turns south through the Mission District towards Daly City. The BART stations nearest to the Proposed Project study area are 16th Street Mission Station, 24th Street Mission Station, Embarcadero Station at Market Street/Main Street, Montgomery Station at Market Street/Second Street and Powell Station at Market Street/Fifth Street.

Alameda-Contra Costa County Transit District (AC Transit)

AC Transit operates bus service in western Alameda and Contra Costa Counties, as well as routes to the City of San Francisco and San Mateo County. AC Transit operates 33 "Transbay" bus routes between the East Bay and the Temporary Transbay Terminal, temporarily located at Howard Street and Beale Street. The Temporary Transbay Terminal lies just outside of the Proposed Project study area and is easily accessible via Muni and regional transit lines. The majority of Transbay service is provided only during commute periods in the peak direction of travel, with headways between buses from 15 to 20 minutes. The peak direction of service is into San Francisco during the AM peak period and out of San Francisco during the PM peak period. All-day service is provided on a few lines, with headways of approximately 30 minutes.

San Mateo County Transit District (SamTrans)

SamTrans operates bus service in San Mateo County. A few SamTrans routes also serve the Temporary Transbay Terminal in downtown San Francisco, including Routes 292, 397, and KX. Route 292 makes San Francisco stops along Potrero Avenue and Mission Street throughout the day. AM peak hour headways are between 15 and 30 minutes, and PM

peak hour headways are 15 minutes. Route 397 runs along Mission Street in San Francisco and serves the Temporary Transbay Terminal. It is a late night service route with headways of one hour. Route KX operates only during the peak travel periods with 60-minute headways, and travels between the Temporary Transbay Terminal and Redwood City.

Golden Gate Transit

The Golden Gate Bridge, Highway, and Transportation District operates Golden Gate Transit (GGT), which provides bus and ferry service between the North Bay (Marin and Sonoma counties) and San Francisco. GGT operates 22 commuter bus routes, nine basic bus routes, and 16 ferry feeder bus routes for ferries into San Francisco. Bus routes operate at headways of 15 to 90 minutes depending on time and day of week and bus type. Near the study area Golden Gate Transit operates commuter and basic routes on Mission Street, Howard Street, Folsom Street, Sixth Street and Eighth Street. Golden Gate Transit also operates ferry service between the North Bay and San Francisco, connecting Larkspur and Sausalito with the Ferry Building during the morning and evening commute periods.

TABLE 9: REGIONAL TRANSIT OPERATIONS				
Route	AM Peak Weekday Headways (7AM-9AM)[1]	PM Peak Weekday Headways (4PM-6PM)[1]	Hours of Operation	Areas Served by Route
Caltrain Local	No local service during peak hours	No local service during peak hours	4:30AM-12:00AM (IB) 5:00AM-1:30AM (OB)	San Francisco, San Mateo County, San Jose
Caltrain Limited-Stop	10-20	10-20	5:50AM-8:00PM (IB) 6:10AM-8:20PM (OB)	San Francisco, San Mateo County, San Jose
Caltrain Baby Bullet	15-40	20-40	5:45AM-7:30PM (IB) 7:00AM-7:40PM (OB)	San Francisco, San Mateo County, San Jose
BART	5-15	5-15	4:00AM-12:00AM (IB/OB)	East Bay, San Francisco, San Mateo County
AC Transit	15-20	15-20	24 hours per day (IB/OB)	East Bay, San Francisco
SamTrans Route 292	15-30	15	4:00AM-2:30AM (IB) 4:30AM-12:00AM (OB)	San Mateo County, SFO, Transbay Terminal
SamTrans Route KW	60	60	5:00AM-9:30AM (IB) 3:30PM-8:30PM (OB)	Redwood City, San Carlos, San Mateo, San Francisco
SamTrans Route 397	No service during peak hours	No service during peak hours	12:45AM-5:00AM (IB) 1:00AM-6:50AM (OB)	Palo Alto, SFO, Transbay Terminal
GGT commuter and basic bus routes	15-90	15-90		North Bay, San Francisco

Notes:
1. Headway in minutes.

Source: Caltrain, BART, AC Transit, SamTrans, GGT; Prepared by Fehr & Peers, 2015.

2.4.2.1 Regional Transit Screenlines

Similar to Muni, transit service into and out of San Francisco on regional service providers is examined on a screenline basis. The existing regional transit screenlines, as described in the *SF Guidelines*, were used to analyze

regional transit capacity in the study area. **Table 10** presents the ridership and capacity utilization at the MLP for the regional screenlines during the weekday AM and PM peak hours. For regional operators, the MLP is typically at the San Francisco city limit (i.e., the East Bay MLP would occur at the Transbay Tube and on the Bay Bridge; the North Bay MLP would occur at the Golden Gate Bridge; and the South Bay MLP would occur at the southern city border). Inbound travel (into downtown San Francisco) is analyzed during the AM weekday peak period and outbound travel (out of downtown San Francisco) is analyzed during the PM weekday peak period.

For regional transit providers, the established capacity utilization threshold is equal to the number of available seats (and standing area, in the case of BART), representing 100 percent of capacity. As shown in **Table 10**, BART currently experiences over-capacity conditions in both the AM and PM peak hours to and from the East Bay. As a result, the regional screenline between San Francisco and the East Bay is over its capacity utilization threshold in the AM peak hour. All other regional screenlines operate within their designated capacity utilization thresholds.

TABLE 10: REGIONAL TRANSIT SCREENLINES – EXISTING CONDITIONS

Regional Screenline	AM Peak Hour (Inbound)			PM Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
East Bay						
BART	25,399	23,256	**109%**	24,488	22,784	**107%**
AC Transit	1,568	2,829	55%	2,256	3,926	57%
Ferries	810	1,170	69%	805	1,615	50%
Screenline Total	*27,777*	*27,255*	***102%***	*27,549*	*28,325*	*97%*
North Bay						
Golden Gate Transit Bus	1,330	2,543	52%	1,384	2,817	49%
Ferries	1,082	1,959	55%	968	1,959	49%
Screenline Total	*2,412*	*4,502*	*54%*	*2,352*	*4,776*	*49%*
South Bay						
BART	14,150	19,367	73%	13,500	18,900	71%
Caltrain	2,171	3,100	70%	2,377	3,100	77%
SamTrans	255	520	49%	141	320	44%
Ferries	-	-	-	-	-	-
Screenline Total	*16,576*	*22,987*	*72%*	*16,018*	*22,320*	*72%*
Regional Screenlines Total	*46,765*	*54,744*	*85%*	*45,919*	*55,421*	*83%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015 and October 2016.

2.5 PEDESTRIAN FACILITIES



In the northern part of the Proposed Project study area, in the SoMa neighborhood just north of Mission Creek, the blocks are fairly large and some streets are relatively wide, though some streets (such as Townsend Street) have been transitioning to improve the pedestrian environment. The central part of the Proposed Project study area, in Mission Bay, is largely under construction or planned for future construction. As a result, pedestrian facilities can be discontinuous in some areas; however, the overall plan for the area would result in a well-connected pedestrian network with more pedestrian-scale block sizes and street designs. In the southern part of the Proposed Project study area, in the Dogpatch neighborhood, the north/south blocks are very long, with the east/west blocks being much shorter. While pedestrian facilities are relatively complete (continuous sidewalks, appropriate sidewalk width, marked crosswalks) along Third Street, both west of Third Street and to the east adjacent to the Proposed Project site along the east side of Illinois Street between 20th and 18th streets there are gaps in the sidewalk, reflective of the area's industrial roots. These gaps make some areas difficult for pedestrians to traverse, especially near freeway on- and off-ramps.

A qualitative evaluation of existing pedestrian conditions was conducted during field visits to the Proposed Project study area in May 2015. The field visits identified a lack of pedestrian facilities at some of the 37 existing study intersections, including locations with missing sidewalks, crosswalks, ADA accessible curb ramps, and pedestrian countdown signals. Although some signals do not provide pedestrian countdown signals, at a minimum, basic pedestrian signal heads (with or without countdown indications) are currently provided at all signalized study intersections except for 20th Street and Illinois Street (although, as noted elsewhere in this document, that signal is currently operating in flashing red mode, indicating an all-way stop). **Figure 5** depicts existing pedestrian facilities that are not constructed with the full suite of typical pedestrian amenities, highlighting crosswalk closures, multiple turning lanes into a crosswalk, and lack of ADA accessible curb ramps.

Pedestrian facilities generally are most complete in the area bounded by King Street, Bryant Street, The Embarcadero, and Seventh Street. The majority of intersections in this area have adequate curb ramps, crosswalks and only single turning lanes. However, south of Mission Creek, missing connections on the pedestrian network make walking difficult, due in some part to the fact that this portion of Mission Bay is currently building out. Specifically, there is no sidewalk on the east side of Illinois Street from a few hundred feet of north of 20th Street and to just south of Mariposa Street.

General pedestrian impediments observed across the study area include:

- Narrow sidewalks;
- Intersections with no crosswalks;
- Construction zones that reduce sidewalk width or close crosswalks, at times for extended periods;
- Lack of ADA curb ramps or use of shared diagonal curb ramps at intersection corners;
- Freeway on- and off-ramps with short pedestrian crossing phases and/or high vehicle volumes turning into crosswalks across multiple traffic lanes; and
- Long distances between intersections, particularly in the north-south direction, limiting crossing opportunities.



ADA Curb Ramp Not Present

Multiple Turning Lanes

Crosswalk Closed

Study Area

Figure 5

Existing Pedestrian Network

These pedestrian impediments are most prevalent along particular corridors, including Illinois Street, Pennsylvania Avenue, Indiana Street, 16th Street, and Mariposa Street. These corridors contain a majority of the intersections with multiple pedestrian impediments (i.e., missing or closed crosswalks, missing or diagonal curb ramps, and multiple turning lanes). Pennsylvania Avenue presents particularly challenging pedestrian environments, with numerous freeway on- and off-ramps, narrow or missing sidewalks, and largely industrial or auto-centric land uses.

Particularly challenging areas for pedestrians were the I-280 northbound off-ramp and I-280 southbound on-ramp at Mariposa Street and I-280 southbound on- and off-ramps at Pennsylvania Avenue. There are no crosswalks, curb ramps, or pedestrian signal heads at the Mariposa Street on- and off-ramps, causing pedestrians to have to walk a long distance before being able to cross Mariposa Street. Some of these issues, including new crosswalks, would be addressed by the proposed improvements along Mariposa Street. Similarly, there are no pedestrian facilities at the Pennsylvania on and off ramps, and the sidewalks along Pennsylvania Avenue between Cesar Chavez Street and 23rd Street are either very narrow with many obstacles such as utility poles, or missing altogether.

Additionally, the intersection of Fourth Street and King Street is challenging for pedestrians due to a number of factors. The KT Ingleside/Third LRT station is in the middle of Fourth Street, south of King Street; the N Judah LRT Station is in the middle of King Street, west of Fourth Street; and the Fourth and King Caltrain Station (the system's northern terminus and busiest station) is on the northwest corner of the intersection. Additionally, there is a double-right turn lane from southbound Fourth Street to westbound King Street, which eventually becomes I-280 one block to the west. The high volume of pedestrians crossing at all legs of this intersection, transferring between transit routes at three different transit stations, while traffic attempts to enter or exit I-280 at King Street, creates a substantial number of conflicts between modes, particularly between pedestrians and autos. However, the distance between the Proposed Project and this intersection is large, and it is unlikely that many Project-generated pedestrian trips or vehicle trips would use this intersection, except as related to the Proposed Project's shuttle system if shuttles stop near this location. Similar to Mariposa Street, improvements are planned for this intersection as part of construction of the Central Subway through signal retiming and reduction in auto travel lanes to provide right of way for the light rail. This will likely reduce the number of pedestrian/vehicle conflicts at the intersection. These improvements are expected to be complete by 2019.

When this TIS was being prepared in 2015, construction was occurring on the south side of 16th Street limited pedestrian movements at Owens Street. Sidewalks are missing along the eastern side of Illinois Street between 20th Street and 18th Street.

The existing condition on the project site has limited pedestrian facilities with few sidewalks or crosswalks.

In total, 16 of the 37 existing intersections have inadequate pedestrian facilities that are missing at least one pedestrian curb ramp at a crosswalk terminus. Six intersections had crosswalks closed due to construction during observations. Most pedestrian signals in the study area include countdown indications.

Currently, pedestrian volumes around the Proposed Project site are generally low. There is more activity along Third Street, particularly at light rail stops. There is also a fair amount of pedestrian activity along 22nd Street related to the shops and cafes between Illinois Street and Indiana Street, and to the Caltrain Station.

2.6 BICYCLE CIRCULATION



Bicycle facilities through the Proposed Project study area consist of bicycle paths, separated bicycle lanes, and bicycle routes.

Bicycle Paths (Class I) provide a completely separated right of way for the shared use of cyclists and pedestrians. These facilities are off-street and minimize cross-flow traffic, but they can be adjacent to an existing roadway.

Separated Bicycle Lanes (Class II) provide a striped, marked and signed bicycle lane separated from vehicle traffic. These facilities are located on roadways and reserve a minimum of four to five feet of space for exclusive bicycle traffic. Class II lanes can sometimes include a buffer between the auto travel lane and the bicycle lane.

Bicycle Routes (Class III) provide a shared travel lane marked and signed for shared use with motor vehicle traffic. These facilities may or may not be marked with "sharrows" to emphasize that the roadway space is shared.

Current on-street bicycle facilities, as designated by the San Francisco Bikeway Network Map (2013) are shown on a map of the Proposed Project study area in **Figure 6**. Bicycle volume counts were conducted during the weekday AM and PM peak periods (7:00 AM-9:00 AM and 4:00 PM-6:00 PM, respectively) in September of 2013 and January of 2014. The majority of the study area is flat, with limited changes in grades, facilitating bicycling within and through the area.

The following bicycle facilities run through the Proposed Project study area:

- **Route 5** runs through the study area along Terry A. Francois Boulevard and Illinois Street. It is signed as a Class II bicycle lane.
- **Route 7** runs along Indiana Street in the study area, connecting to Mariposa Street in the north and to Third Street via Cesar Chavez Street in the south. It is signed as a Class III bicycle route.
- **Route 23** runs north-south within the study area along Seventh Street to Mariposa Street via Mississippi Street and terminates at Illinois Street. It is signed as a Class II bicycle lane.
- **Route 36** runs east and west along Townsend Street from The Embarcadero to 8th Street and then to the west along 14th Street as a Class II bicycle lane.
- **Route 40** runs east and west in the study area along 16th Street as a Class II bicycle lane and terminates in the east at Third Street. It continues through the Twin Peaks neighborhood until it terminates to the west at the Great Highway via Kirkham Street through the Sunset neighborhood.
- **Route 60** runs east and west in the study area along Cesar Chavez Boulevard. It is signed as a Class II bicycle lane between Third Street and Pennsylvania Street and as a Class III bicycle route west of Pennsylvania Street.



Bicycle Route Class II

Planned Class II Bike Route

Bicycle Route Class III

Bay Trail

Bicycle Route Number

Figure 6

Existing Bicycle Network

- Additionally, the **San Francisco Bay Trail** runs along Illinois Street adjacent to the Proposed Project (from Cargo Way to the south to Terry A. Francois Boulevard at Mariposa Street to the north. The Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. It will connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major toll bridges in the region. To date, approximately 338 miles of the alignment have been completed. Route 5 is part of the Bay Trail.

Fourth Street and Terry A. Francois Boulevard provide north-south connections from the SoMa neighborhood to the Dogpatch and Potrero Hill neighborhoods, as well as the UCSF Mission Bay campus. North of Mission Creek, the study area is served by Fifth Street, Second Street, Howard Street, Folsom Street, and King Street / The Embarcadero.

2.7 LOADING FACILITIES

The Proposed Project site is currently occupied by self-storage facilities, warehouses, automobile storage lots, a parking lot, a soil recycling yard, artists' studios, and office spaces. Although the uses in the study area are largely industrial, during data collection, little truck activity was observed entering and exiting the Proposed Project site.



Loading activity at the loading docks was observed during the morning (10:00 AM – 11:30 AM) and afternoon (4:00 PM – 5:30 PM) of a typical weekday in January 2016. Trucks were observed to be on Illinois Street between 18th Street and 23rd Street throughout the day. There are currently no on-street loading spaces, but 25 loading docks are located along the frontage of the American Industrial Center (AIC) on the west side of Illinois Street between 20th Street and 22nd Street, i.e. across Illinois Street from the Proposed Project site. Much of this area is used for parking of private vehicles and small vans.

Throughout the day, approximately eight loading docks near the middle of the block appeared to be available for loading activities, but trucks were only observed at two to three of the docks. Six trucks were observed during the morning, three of which did not pull into the loading docks, instead illegally using the sidewalk and/or the bike lane throughout the pick-up and/or delivery activity (typically about five minutes in duration). In the afternoon, only four trucks were observed at the loading docks, two of which illegally dwelled on the sidewalk and/or bike lane for at least fifteen minutes instead of correctly pulling into the dock. Additionally, two vans were observed illegally loading on the sidewalk in front of the southernmost loading docks and three mid-sized cars utilized the loading docks for several minutes for delivery/pick-up. The informality of loading while illegally blocking the sidewalk and/or bike lane in the area creates potential conflicts with pedestrians and bicyclists, as the west side of Illinois Street is one elongated driveway apron with no raised curb, and Illinois Street provides a Class II bicycle lane on both sides of the street between Cargo Way and Terry A. Francois Boulevard.

To access the Proposed Project site, trucks access Illinois Street from I-280 via 18th Street, Mariposa Street, 23rd Street, 25th Street, or Cesar Chavez Street. Currently, the roads providing immediate access to the Proposed Project site tend to have low vehicle and pedestrian activity currently, making for easy maneuvering to enter and exit the Proposed Project site.

2.8 EMERGENCY SERVICES & ACCESS



Emergency transport vehicles typically use major streets through the study area when heading to and from an emergency and/or emergency facility. Arterial roadways allow emergency vehicles to travel at higher speeds and provide enough clearance space to permit other traffic to maneuver out of the path of the emergency vehicle and yield the right of way.[14] There are four San Francisco Fire Department fire stations near the Proposed Project study area: Station 8 (Bluxome Street at Fourth Street, 1.5 miles from the Proposed Project), Station 25 (Third Street at Cargo Way, 0.9 miles from the Proposed Project), Station 29 (16th Street at Vermont Street, 1.4 miles from the Proposed Project), and Station 37 (Wisconsin Street at 22nd Street, 0.8 miles from the Proposed Project). The UCSF Mission Bay Medical Center is located in the study area, four blocks north and two blocks west of the Project site, to the north of 16th Street between Owens Street and Third Street. Additionally, the Public Safety Building located at 1245 Third Street opened in early 2015 and includes a new fire station (0.8 miles from the Proposed Project).

[14] Per the California Vehicle Code, Section 21806, all vehicles must yield right of way to emergency vehicles and remain stopped until the emergency vehicle has passed.

3 BASELINE CONDITIONS

Typically, transportation analyses include an Existing and an Existing Plus Project analysis to isolate the impacts associated with a project by comparing conditions with the proposed project in place to the existing baseline. However, in select circumstances, it may be appropriate to establish a different baseline than existing conditions, particularly in cases where comparison to the existing conditions may provide misleading information or information that does not provide value to the public or to decision-makers.

The Proposed Project sits within a rapidly changing part of San Francisco. Because of the substantial changes in the area, there are a number of land use and transportation projects that are already either constructed, or will be under construction or have completed constructed prior to the construction of the Proposed Project. For this reason, the Proposed Project's impacts were compared to a baseline condition in the year 2020 that includes development and infrastructure projects that meet the following criteria:

- Projects that are under construction at the time the Notice of Preparation (NOP) for the Proposed Project's environmental review was published
- Projects that are approved and funded at the time of publication of the Notice of Preparation (NOP) for the Proposed Project and are likely to be completed prior to the construction of the Proposed Project

These projects include:

- UCSF Medical Center / Mission Bay Hospital / Mission Bay Hall (constructed and operating as of February 2015)
- Public Safety Building (constructed and operating as of late 2014)
- 20th Street Historic Core adaptive reuse (under construction)
- 650 Indiana Street (approved 2014, under construction)
- 800 Indiana Street (approved)
- 851 Tennessee Street (constructed 2013)
- 1201-1225 Tennessee Street (approved 2014, under construction)
- 2121 Third Street (approved 2012, constructed 2013)
- 2235 Third Street (constructed 2012)
- 1001 17th Street (approved 2013)
- 616 20th Street (approved 2012, constructed 2013)
- 1200 17th Street / 901 16th Street (approved 2012, under construction)
- 1000 16th Street (approved 2012, under construction)
- 22 Fillmore Rapid Network Project: 16th Street transit lanes, from Church Street to Third Street (approved 2016, expected completion 2019)
- Central Subway (under construction, planned to open in 2019)
- Mariposa Street infrastructure upgrades/Owens Street extension (planned)
- MUNI Bus Line 55 (operating as of January 2015)

Several projects, including the UCSF Medical Center/ Mission Bay Hospital / Mission Bay Hall and the Public Safety Building opened after the collection of the traffic data; however, they are considered baseline projects and baseline traffic volumes have been adjusted to account for them, as well as the remainder of the land use development

projects listed above. These land use and related infrastructure projects affect the circulation conditions on 16th Street, Mariposa Street, and the surrounding roadway network.

3.1 ROADWAY NETWORK CHANGES

The following changes were made to the transportation network, based on the fact that these changes are fully funded and will be constructed as a result of the UCSF Mission Bay Medical Center opening (these are the changes referenced by "Mariposa infrastructure upgrades/Owens Street extension" in the bulleted list on the previous page:

- Owens Street will be extended between 16th and Mariposa Streets, to connect with the I-280 on- and off-ramps and to create a new intersection at Mariposa Street. The existing signal at the intersection of Mariposa Street and the I-280 northbound off-ramp will be upgraded to accommodate the new Owens Street approach.

- Mariposa Street will be widened on the north side by approximately 15 feet, and left turn lanes striped at major intersections. The Mariposa Street Bridge over the Caltrain tracks will be restriped to provide two exclusive westbound left turn lanes for a total of three lanes, which will create a new signalized intersection with Owens Street.

- The northbound I-280 off-ramp will be widened to the east to provide an additional lane and better align with Owens Street. While the intersection with Mariposa Street will be improved at the terminus of this ramp, no changes are planned at the freeway diverge segment. Mariposa Street between the I-280 southbound on-ramp and Pennsylvania Avenue will be re-striped to accommodate the lane configurations described above.

- The existing stop-controlled intersection of Mariposa Street and the I-280 southbound on-ramp (with the eastbound approach stop-controlled) will be signalized.

Roadway network changes proposed by the Proposed Project, as described in Section 1.2.3 (Roadway Network Improvements), were included in the transportation network for all Baseline Plus Project scenarios.

The intersection of 19th Street / Illinois Street will also be signalized with the Central Subway Loop Project (described in more detail in Section 3.2).

There are other projects currently being contemplated in the study area, such as the proposed New Arena for the Golden State Warriors and the Seawall Lot 337 (Mission Rock) development project. These projects are not included in the Baseline Condition because they were not approved and funded at the time of the NOP. The cumulative effects of the Proposed Project and these other pending development projects are evaluated in Chapter 5 – Cumulative Conditions.

3.2 TRANSIT OPERATIONS

As mentioned, transit conditions are expected to change substantially in the area over the next several years. The Central Subway (T Third) will provide a connection from the Caltrain station at Fourth Street / King Street to Chinatown. The new connection will be a subway that will serve major employment and population centers in San Francisco. Construction of the project began in 2010 and the subway extension is expected to be operational and open to the public by 2019. Because the T Third is a major transit connection to the Proposed Project, and the

Central Subway is under construction, it has been included in the Baseline Conditions transit analysis. Other transit improvements that are also included in the Baseline are described below.

3.2.1 Recent and Proposed Changes to Transit Service

Muni Forward is a set of improvements throughout the SFMTA transit network and has been informed by the Transit Effectiveness Project (TEP). Muni Forward serves as both a thorough review of and repositioning of San Francisco's public transit system, initiated by SFMTA in collaboration with the City Controller's Office. Muni Forward is aimed at improving reliability, reducing travel times, providing more frequent service and updating Muni bus routes and rail lines to better match current travel patterns.

Muni Forward recommendations include new routes and route realignments, more service on busy routes, and elimination or consolidation of certain routes or route segments with low ridership. The Muni Forward recommendations were unanimously endorsed by the SFMTA Board of Directors in October 2008 for environmental impact review. The initial Muni Forward recommendations were revised based on public feedback on the draft Muni Forward Environmental Impact Report (Muni Forward EIR). The Muni Forward EIR was certified on March 27, 2014, and the SFMTA Board of Directors approved most of the Service Improvements and portions of the Transit Travel Time Reduction Proposals on March 28, 2014.[15]

The Muni Forward projects would be implemented based on funding and resource availability. The Muni Forward Implementation Strategy anticipates that many of the improvements would be implemented sometime between Fiscal Year 2014 and Fiscal Year 2019, subject to funding sources and resource availability.[16] The following changes are proposed by Muni Forward for routes in the Proposed Project study area and are incorporated in the Baseline analysis:

- As part of the Central Subway (revenue service expected in 2019), the T Third route, peak period headways would be reduced from 9 to 8 minutes, and all runs will consist of 2-car trains to result in capacity improvements.
- Also a part of the Central Subway, a "short line" is planned to serve high demand in Chinatown. This route will run south along Third Street, and will then turn back at 18th Street, Illinois Street, and 19th Street. The Loop would provide a turnaround for trains during peak periods and special events once the Central Subway extending the T-Third line north to Chinatown opens in 2019. The short line loop project was approved by the SFMTA Board of Directors and is currently under construction. This project has been assumed in the Baseline Conditions analysis with respect to transit ridership and the proposed signalization of the intersection of 19th Street and Illinois Street.

[15] San Francisco Planning Department. 2014. TEP Final EIR, March 27, 2014, Available online at http://tepeir.sfplanning.org. Accessed April 3, 2014. Case No. 2011.0558E. The document and supporting information may also be viewed at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA in case file 2011.0558E.

[16] San Francisco Municipal Transportation Agency. 2014. TEP Implementation Workbook, March 5, 2014, Available online at: http://www.sfmta.com/sites/default/files/projects/TEP%20Implementation%20Plan%20-%20Section%201%20%282%29_1.pdf. Accessed June 16, 2016.

- The 10 Townsend will be rerouted off of Townsend down Fourth Street. From Fourth Street the route would extend through Mission Bay to new proposed street segments on Seventh Street between Mission Bay Boulevard and Hubble Street, on Hubble Street between Seventh and 16th streets, on 16th Street between Hubble and Connecticut streets, and on Connecticut Street between 16th and 17th streets. Peak period headways would be reduced from 20 to 6 minutes. Midday headways would be reduced from 20 to 12 minutes. The 10 Townsend will be renamed the 10 Sansome.

- Service on the 55 16th Street began in January 2015. This route follows 16th Street between Mission Street to Third Street and Third Street from 16th Street to Mission Bay Boulevard North. This route provides interim service that will be in place prior to extension of the 22 Fillmore line change (which requires extension of overhead wire).

- The 22 Fillmore line is a funded improvement that will extend down 16th Street and Third Street to the UCSF Mission Bay campus and is part of a bus-rapid transit (BRT) proposal which would remove a general use travel lane on 16th Street through the study area. The 33 Stanyan would be re-routed from Potrero Avenue to cover 22 service on 18th Street.

- 33 Stanyan line will take over the current route of the 22 Fillmore, terminating at 20th Street. The current route travels north/south along Potrero Avenue and terminates at 25th Street. The route changes lead to an extension east along 16th Street, Connecticut Avenue, and 18th Avenue before reaching its new terminus at Third Street and 20th Street.

Changes to the 48 Quintara / 24th Street are anticipated but there is no planned date for its implementation. As such, those changes have been incorporated into the Cumulative Conditions analysis and are discussed in Chapter 6.

The peak hour load and capacity utilization shown in **Table 11** assumes that the Central Subway is operational on Opening Day of the Proposed Project (when the first building is occupied). The Central Subway is planned to open in 2019 and would add capacity to the existing Muni network along the T Third line. The ridership data provided is from a 2020 SF-CHAMP Model run provided by the SFMTA for another development project. This is the earliest timeframe for projections that include the planned Central Subway capacity.

The model run was checked to determine what the assumed land uses for Pier 70 were as compared to an existing model (2012) and a buildout model (2040). There was substantial growth in the traffic analysis zone that includes Pier 70 and adjustments were made to the transit ridership projections to account for the appropriate growth from that TAZ in the Baseline Conditions scenario.

The capacity utilization calculation in the inbound direction uses AM data and in the outbound direction PM data to align with the peak directions of travel and patronage loads for the Muni system to or from the downtown area during those periods. As shown in Table 11, all screenlines operate below Muni's 85 percent capacity utilization standard, except for the southwest screenline in the AM peak (as a result of 97 percent utilization on the subway lines). **Table 12** shows the 2020 data for the regional screenlines, which also reflect projections from the 2020 SF-CHAMP Model run and additional data provided by BART. As under Existing Conditions, the AM peak hour screenline to the East Bay would continue to exceed its capacity utilization threshold while all other screenlines would continue to operate within their capacity utilization standards.

TABLE 11: MUNI DOWNTOWN SCREENLINES AND PROJECT-SPECIFIC LINES – BASELINE CONDITIONS

Screenline	AM Peak Hour (Inbound)			PM Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
Northeast						
Kearny/Stockton	2,273	3,157	72%	2,444	3,327	73%
Other lines	710	1,141	62%	903	1,155	78%
Screenline Total	*2,983*	*4,298*	*69%*	*3,347*	*4,482*	*75%*
Northwest						
Geary	2,302	3,764	61%	2,913	3,621	80%
California	1,436	2,010	71%	1,349	1,752	77%
Sutter/Clement	514	630	82%	523	630	83%
Fulton/Hayes	1,505	2,237	67%	1,544	1,838	84%
Balboa	553	1,008	55%	537	974	55%
Screenline Total	*6,310*	*9,649*	*65%*	*6,866*	*8,815*	*78%*
Southeast						
Third Street	1,025	3,808	27%	1,836	3,808	48%
Mission	2,155	2,632	82%	1,927	2,632	73%
San Bruno/Bayshore	1,867	2,197	85%	1,761	2,134	83%
Other lines	1,577	1,756	**90%**	1,213	1,675	72%
Screenline Total	*66,624*	*10,393*	*64%*	*6,737*	*10,249*	*66%*
Southwest						
Subway lines	6,783	7,020	**97%**	5,433	6,804	80%
Haight/Noriega	1,178	1,596	74%	1,065	1,596	67%
Other lines	474	560	85%	655	840	78%
Screenline Total	*8,435*	*9,176*	***92%***	*7,153*	*9,240*	*77%*
Muni Screenlines Total	*24,352*	*33,515*	*73%*	*24,103*	*32,786*	*74%*
Individual Muni Routes						
22 Fillmore IB[1]	501	882	57%	436	939	46%
22 Fillmore OB[1]	340	882	39%	400	939	43%
48 Quintara/24th Street IB	119	252	47%	160	252	63%
48 Quintara/24th Street OB	199	252	79%	213	252	85%
T Third IB	1,097	3,808	29%	1,940	3,808	51%
T Third OB	1,931	3,808	51%	1,742	3,808	46%

Notes:

Bold indicates capacity utilization of 85 percent or greater.

Baseline condition is a modified existing condition.

1. Ridership and capacity for the 22 Fillmore include both the 22 Fillmore and the 33 Stanyan routes, since they will both provide complimentary service to and from the project area.

Source: Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

TABLE 12: REGIONAL TRANSIT SCREENLINES – BASELINE CONDITIONS

Regional Screenline	AM Peak Hour (Inbound)			PM Peak Hour (Outbound)		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization
East Bay						
BART	8,000	25,680	**109%**	27,000	25,680	**105%**
AC Transit	1,596	2,829	56%	2,297	3,926	59%
Ferries	818	1,170	70%	813	1,615	50%
Screenline Total	*30,414*	*29,679*	***102%***	*30,110*	*31,221*	*96%*
North Bay						
Golden Gate Transit Bus	1,344	2,543	53%	1,399	2,817	50%
Ferries	1,088	1,959	56%	973	1,959	50%
Screenline Total	*2,432*	*4,502*	*54%*	*2,372*	*4,776*	*50%*
South Bay						
BART	16,000	21,400	75%	15,000	21,400	70%
Caltrain	2,258	3,100	73%	2,472	3,100	80%
SamTrans	266	520	51%	147	320	46%
Ferries	-	-	-	-	-	-
Screenline Total	*18,524*	*25,020*	*74%*	*17,619*	*24,820*	*71%*
Regional Screenlines Total	*51,370*	*29,201*	*87%*	*50,101*	*60,817*	*82%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

Baseline condition is a modified existing condition.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015 and October 2016

3.3 BICYCLE NETWORK CHANGES

The *San Francisco Bike Plan* (June 2009) (herein "Bike Plan") includes several near-term improvements to the city's bicycle network within the Proposed Project study area. Bicycle lanes on Second Street from King Street to Market Street (also included in the Second Street Improvement Project) are planned for construction to begin in 2016, and are therefore included in the Baseline Conditions. Though identified as near-term improvements in the *Bike Plan*, projects on Fifth Street, from Townsend to Market streets; Fremont Street, from Harrison to Howard streets; and 16th Street, from Third Street to Terry A. Francois Boulevard are unfunded at this time and are included in Cumulative Conditions only.

3.4 PEDESTRIAN NETWORK CHANGES

Few pedestrian network changes will be implemented within the Proposed Project study area under Baseline Conditions. When Existing Conditions were evaluated, construction on the south side of 16th Street limited pedestrian movements at Owens Street. This construction is expected to conclude prior to 2018, and pedestrian travel along the south side of 16th Street will be unobstructed under Baseline Conditions. Other pedestrian improvements that are part of other projects described above (e.g., new sidewalks and crosswalks at the Mariposa / I-280 ramps intersections associated with the widening of Mariposa Street) will also be included in Baseline Conditions.

3.5 LOADING NETWORK CHANGES

No loading network changes are expected between Existing and Baseline Conditions. As described in more detail under the Existing Conditions section, loading activity at the loading docks was observed during the morning (10:00 AM – 11:30 AM) and afternoon (4:00 PM – 5:30 PM) of a typical weekday to gauge existing loading activity. Trucks were observed to be on Illinois Street between 18th Street and 23rd Street throughout the day. Twenty-five loading docks are located along the building frontage on the west side of Illinois Street between 20th Street and 22nd Street. Throughout the day, approximately eight loading docks near the middle of the building appeared to be available for loading activities, but trucks were only observed at two to three of the docks.

3.6 EMERGENCY SERVICES & ACCESS

There are no changes from Existing to Baseline Conditions for emergency services and access. As described in the Existing Conditions section, five fire stations will continue to serve the Proposed Project study area: Station 8 (Bluxome Street at Fourth Street, 1.5 miles from the Proposed Project), Station 25 (Third Street at Cargo Way, 0.9 miles from the Proposed Project), Station 29 (16th Street at Vermont Street, 1.4 miles from the Proposed Project), Station 37 (Wisconsin Street at 22nd Street, 0.8 miles from the Project) and the Public Safety Building (at 1245 Third Street) includes a fire station (0.8 miles from the Proposed Project). The UCSF Mission Bay Medical Center, located in the study area to the north of 16th Street between Owens Street and Third Street, will serve the Proposed Project.

4 TRAVEL DEMAND ANALYSIS

Travel demand refers to the new vehicle, transit, bicycle and pedestrian traffic that would be generated by the Proposed Project. This chapter provides forecasts of the trips that would be generated by the Proposed Project for both the Maximum Residential Scenario and Maximum Commercial Scenario. Parking demand and delivery/service vehicle-trips for the new uses are also presented. The travel demand forecasting methodology and the forecasts themselves are presented in more detail in a separate memorandum completed by Adavant Consulting, titled "*Pier 70 Special Use District Project – Estimation of Project Travel Demand*" dated October 22, 2015, included in **Appendix E**. The forecasts are based on methodology contained in the *SF Guidelines* and supplemented with information to account for the large scale and mixed-use qualities of the Proposed Project. Trip generation summaries for both the Maximum Residential Scenario and Maximum Commercial Scenario are provided within this chapter

4.1 TRIP GENERATION

The first step in calculating travel demand is to determine the person-trip generation rate. Internal capture rates and mode splits are then applied to the person-trip generation rate.

The person-trip generation estimates for the two Proposed Project scenarios include residents, employees and visitors to the proposed development. The weekday daily and PM peak hour person-trip generation for the proposed uses at Pier 70 are based on the appropriate rates as provided by Table C-1 in the SF Guidelines. Trip generation has also been estimated for the weekday AM peak hour based on trip generation rates for the AM peak hour developed for this study[17] using information obtained from the ITE.

The Proposed Project includes nine acres of open space, which this analysis assumes would also generate trips. To calculate trips generated by the nine-acre open space provided in the Proposed Project, this analysis uses vehicle rates and in/out splits from ITE, which are in line with the type and extent of use expected from the Proposed Project.[18] Data collected from Heron's Head Park, a 22-acre open space and wildlife habitat on the eastern shoreline of San Francisco approximately two miles south of the Proposed Project site, provided mode split and average vehicle occupancy.[19] The open space trips are the same for the Maximum Residential Scenario and the Maximum Commercial Scenario because both scenarios include nine acres of open space. All trips to and from the open space

[17] The *SF Guidelines* do not include trip generation rate estimates for the AM peak hour.

[18] The *SF Guidelines* do not include trip generation rate estimate for open space land uses. Based on data availability, this analysis uses peak hour trip generation and in/out split from City Park, ITE Code 411. The daily rate is calculated by applying a conversation rate derived from the PM peak and Daily trip generation rates for County Park, ITE Code 412 to the PM peak hour rate for City Park. These calculations are detailed in **Appendix E** and the methodology is consistent with other projects in the City.

[19] This analysis did not use the trip generation data from the Heron's Head survey because ITE rates were found to more closely match the expected activity level of the park, which would have a higher level of programming and diversity of use than Heron's Head Park. However, the location and transportation context of Heron's Head Park provides applicable data on mode split and average vehicle occupancy.

are assumed to all be external trips. This is a conservative estimate, as it assumes that no trips to and from the park come from individuals already visiting or residing at the Proposed Project.

Table 13 presents the weekday daily, AM peak hour, and PM peak hour person-trip generation forecasts for the Proposed Project. The Proposed Project would generate 131,359 total daily person-trips on a typical weekday, 10,605 person-trips in the AM peak hour, and 15,869 person-trips during the weekday PM peak hour in the Maximum Residential Scenario (including both internal and external trips)[20]. The Proposed Project would generate 141,366 total daily person-trips on a typical weekday, 10,767 person-trips in the AM peak hour, and 15,651 person-trips during the weekday PM peak hour in the Maximum Commercial Scenario (including both internal and external trips).

TABLE 13: PROPOSED PROJECT PERSON TRIP GENERATION (INTERNAL + EXTERNAL TRIPS)

Land Use	Maximum Residential Scenario				Maximum Commercial Scenario			
	Size	Daily	AM Peak Hour	PM Peak Hour	Size	Daily	AM Peak Hour	PM Peak Hour
Residential (studio / 1-bedroom)	1,000 units	7,500	1,067	1,298	545 units	4,088	582	707
Residential (2+ bedrooms)	2,025 units	20,250	2,882	3,503	1,100 units	11,000	1,565	1,903
Office	1,102,250 gsf	19,951	1,775	1,696	2,262,350 gsf	40,949	3,644	3,481
PDR	143,110 gsf	2,590	231	220	143,110 gsf	2,590	231	220
General Retail	269,495 gsf	40,424	941	3,638	275,075 gsf	41,261	961	3,714
Restaurant	67,375 gsf	40,425	3,657	5,457	68,765 gsf	41,259	3,733	5,570
Open Space	9 acres	219	51	57	9 acres	219	51	57
28-Acre Site		114,863	8,977	13,531		121,077	9,047	13,185
Illinois Parcels		16,496	1,628	2,338		20,289	1,720	2,466
Total (internal + external trips)		**131,359**	**10,605**	**15,869**		**141,366**	**10,767**	**15,651**

Note: Numbers may not sum to total due to rounding.

Source: Adavant Consulting, 2016, ITE Trip Generation, 9th Edition, 2012; Fehr & Peers, Heron's Head data collection, 2015.

The *SF Guidelines* do not provide a specific methodology to assess the number of trips that could remain within a large, mixed-use project site and would, therefore, be "double counted" with a literal application of the *SF Guidelines* methodology. Using sources including National Cooperative Highway Research Program (NCHRP) and ITE as an

[20] Internal trips are trip generated by the project that have both an origin and destination within the Project. Examples are trips by residents of the Project to the proposed retail uses or trips by employees to the restaurant uses. External trips are trips that have at least one trip end (either the origin or the destination) outside of the Project.

initial point of analysis and through an iterative process, appropriate internal trip capture rates were identified; the detailed calculations are presented in Appendix E.

Similarly, the *SF Guidelines* do not provide for a methodology for estimating the number of "linked" trips, those trips that are made as intermediate stops on the way from an origin to a primary destination. Therefore, appropriate refinements to the standard travel demand analysis approach had to be made to account for the size and land use mix of a project such as the Proposed Project, with its large proposed mix of residential, retail, and office uses. A complete description of the methodology is located in the full travel demand memo in Appendix E.

Table 14 presents a breakdown of the internal and external trip generation forecasts for the weekday daily, AM and PM peak hour person trips for the Proposed Project. In the Maximum Residential Scenario, the Proposed Project would generate 107,059 external person-trips on a typical weekday, 8,809 external person-trips in the AM peak hour, and 12,227 external person-trips during the weekday PM peak hour). In the Maximum Commercial Scenario, the Proposed Project would generate 127,266 external person-trips on a typical weekday, 9,721 external person-trips in the AM peak hour, and 12,808 external person-trips during the weekday PM peak hour. Approximately 18.5 and 10.0 percent of daily person-trips are forecasted to remain within the Proposed Project in the Maximum Residential Scenario and Maximum Commercial Scenario, respectively. Internalization is dependent on the quantity and mix of uses, as well as the varying levels of activity they generate at various times of the day; as a result, the internalization percentage is different for each scenario and the peak periods.

TABLE 14: PROPOSED PROJECT TRIP GENERATION BY SCENARIO AFTER ESTIMATION OF INTERNAL TRIPS

Scenario	Number of Person Trips[1]					
	Daily		AM Peak Hour		PM Peak Hour	
Maximum Residential Scenario						
Internal	24,300	18.5%	1,796	16.9%	3,643	23.0%
External	107,059	81.5%	8,809	83.1%	12,227	77.0%
Total	131,359	100.0%	10,605	100.0%	15,870	100.0%
Maximum Commercial Scenario						
Internal	14,099	10.0%	1,046	9.7%	2,844	18.2%
External	127,266	90.0%	9,721	90.3%	12,808	81.8%
Total	141,365	100.0%	10,767	100.0%	15,652	100.0%

Notes:

1. Numbers may not sum to total due to rounding

Source: Adavant Consulting, 2016.

4.2 TRIP DISTRIBUTION

The geographic distribution of Proposed Project-generated residential trips was obtained from the *2009-2013 American Community Survey 5-Year Estimate for* Census Tract 226, which corresponds to the Proposed Project study area, supplemented with information from the 1990 and 2000 U.S. Census. Trip distribution for office, retail and restaurant uses was obtained from the *SF Guidelines* for land uses within Superdistricts 1 and 3. Distributions are

based on the origin/destination of the trip, and are separated into the four quadrants of San Francisco (Superdistricts 1 through 4), and the East Bay, North Bay, South Bay and outside the region. Trips from the open space were distributed in the same manner as retail visitor trips, as that category of trips had similar characteristics to the open space trips (not directly related to place of residence or employment, potentially recreational).

As shown in **Table 15**, the majority of the Proposed Project-generated trips would be within San Francisco. These patterns were used as the basis for assigning Proposed Project-generated vehicle trips to the local streets in the study area and transit trips to individual transit lines.

TABLE 15: TRIP DISTRIBUTION

Place of Trip End	Residential Trips	Office/PDR/Restaurant Trips		Retail Trips	
		Workers	Visitors	Workers	Visitors
San Francisco	76.3%	53.2%	67.0%	53.2%	59.0%
Superdistrict 1 (Northeast Quadrant)	*53.4%*	*10.6%*	*17.5%*	*10.6%*	*12.5%*
Superdistrict 2 (Northwest Quadrant)	*3.8%*	*12.5%*	*14.0%*	*12.5%*	*8.0%*
Superdistrict 3 (Southeast Quadrant)	*15.3%*	*20.5%*	*28.5%*	*20.5%*	*34.5%*
Superdistrict 4 (Southwest Quadrant)	*3.8%*	*9.6%*	*7.0%*	*9.6%*	*4.0%*
East Bay	6.5%	18.4%	10.0%	18.4%	7.0%
North Bay	1.9%	5.9%	3.0%	5.9%	3.5%
South Bay	14.9%	20.6%	8.0%	20.6%	8.5%
Out of Region	0.4%	2.2%	12.0%	2.2%	22.0%
Total	100%	100%	100%	100%	100%

Notes:
Source: Pier 70 Travel Demand Memo, Adavant Consulting, 2016 (included as Appendix E)

4.3 MODE SPLIT

The Proposed Project-generated person-trips were assigned to travel modes in order to determine the number of auto, transit and "other" trips. The "auto" category includes those arriving at the site by private automobile and carpool, while the "transit" category includes those arriving to the site by means of public transportation. "Other" includes walk, bicycle, motorcycle, taxi, and additional modes.

Mode split information for the residential portion of the Proposed Project was based on data obtained from the U.S. Census, using data from Census Tract 226, in which the Proposed Project site is located. Mode of travel assumptions for the office, retail, and restaurant uses were obtained from the *SF Guidelines* for employee and visitor trips using an average of Superdistrict 1 and Superdistrict 3. Adjustments were made to account for internal trips, as described in Appendix E. Mode split for the open space land use is derived from the Heron's Head Park mode split data summarized in the previous section and detailed in Appendix E.

Tables 16 and **17** summarize the typical weekday daily, AM and PM peak hour external trip generation by mode of travel for the Maximum Residential Scenario and the Maximum Commercial Scenario. Under the Maximum Residential Scenario during the weekday AM peak hour, the Proposed Project would generate 4,564 external person-trips by automobile (52 percent), 2,665 person-trips by transit (30 percent), and 1,580 person-trips by other modes, including walking (18 percent). During the weekday PM peak hour, the Maximum Residential Scenario would generate 6,251 external person-trips by automobile (51 percent), 2,893 person-trips by transit (24 percent), and 3,083 person-trips by other modes (25 percent). Overall, the Maximum Residential Scenario would generate 39 percent more external person-trips in the PM peak hour than in the AM peak hour, driven by the higher trip generation rate for retail and restaurant uses during the weekday PM peak hour.

Under the Maximum Commercial Scenario during the weekday AM peak hour, the Proposed Project would generate 5,087 external person-trips by automobile (52 percent), 2,818 person-trips by transit (29 percent), and 1,816 person-trips by other modes, including walking (19 percent). During the weekday PM peak hour, the Maximum Commercial Scenario would generate 6,632 external person-trips by automobile (52 percent), 2,809 person-trips by transit (22 percent), and 3,367 person-trips by other modes (26 percent). Overall, the Maximum Commercial Scenario would generate 32 percent more external person-trips in the PM peak hour than in the AM peak hour, driven by the higher trip generation rate for retail and restaurant uses during the weekday PM peak hour.

As shown in **Table 16** and **Table 17**, the overall modal split for the two scenarios of the Proposed Project during the AM and PM peak hours would be relatively similar, with a 1 to 2 percentage point additional transit utilization under the Maximum Residential Scenario in the AM and PM peak hours compared to the Maximum Commercial Scenario; the overall daily modal split for the two scenarios would be very similar, about 21 percent.

The Maximum Commercial Scenario would generate 20,207 (19 percent) additional daily external person-trips than the Maximum Residential Scenario, 912 (10 percent) additional external person-trips during the AM peak hour, and 581 (5 percent) additional external person-trips during the PM peak hour.

TABLE 16: PROPOSED PROJECT TRIP GENERATION BY MODE – MAXIMUM RESIDENTIAL SCENARIO				
Land Use	Person Trips			
	Auto	Transit	Other	Total
Daily Trips				
Residential (studio/1 bedroom)	2,444	1,859	573	4,875
Residential (2 or more bedrooms)	6,599	5,018	1,546	13,163
Office	8,749	4,680	3,628	17,058
PDR	1,136	608	471	2,215
General Retail	17,527	5,129	12,109	34,765
Restaurant	17,527	5,130	12,109	34,766
Open Space	128	-	91	219
Total Daily Trips	***54,110 (50.5%)***	***22,423 (21.0%)***	***30,526 (28.5%)***	***107,059 (100.0%)***
AM Trips				
Residential (studio/1 bedroom)	428	340	107	875
Residential (2 or more bedrooms)	1,157	917	289	2,363
Office	876	541	181	1,598
PDR	114	70	24	207
General Retail	411	239	66	715
Restaurant	1,549	558	892	2,999
Open Space	30	-	21	51
Total AM Trips	***4,564 (51.8%)***	***2,665 (30.3%)***	***1,580 (17.9%)***	***8,809 (100.0%)***
PM Trips				
Residential (studio/1 bedroom)	452	348	108	908
Residential (2 or more bedrooms)	1,219	941	292	2,452
Office	767	462	127	1,357
PDR	100	60	17	176
General Retail	1,472	432	1,006	2,911
Restaurant	2,208	649	1,509	4,366
Open Space	33	-	24	57
Total PM Trips	***6,251 (51.1%)***	***2,893 (23.7%)***	***3,083 (25.2%)***	***12,227 (100.0%)***

Note: Numbers may not sum to total due to rounding.

Source: Adavant Consulting, 2016.

TABLE 17: PROPOSED PROJECT TRIP GENERATION BY MODE – MAXIMUM COMMERCIAL SCENARIO

Land Use	Person Trips			
	Auto	Transit	Other	Total
Daily Trips				
Residential (studio/1 bedroom)	1,277	962	295	2,534
Residential (2 or more bedrooms)	3,438	2,589	793	6,820
Office	19,392	10,606	8,904	38,901
PDR	1,227	671	563	2,461
General Retail	19,084	5,568	13,309	37,960
Restaurant	19,282	5,623	13,466	38,371
Open Space	128	-	91	219
Total Daily Trips	***63,827 (50.1%)***	***26,018 (20.5%)***	***37,421 (29.4%)***	***127,266 (100.0%)***
AM Trips				
Residential (studio/1 bedroom)	228	180	57	465
Residential (2 or more bedrooms)	614	485	153	1,252
Office	1,873	1,167	422	3,462
PDR	118	74	27	219
General Retail	483	287	104	874
Restaurant	1,741	623	1,033	3,397
Open Space	30	-	21	51
Total AM Trips	***5,087 (52.3%)***	***2,818 (29.0%)***	***1,816 (18.7%)***	***9,721 (100.0%)***
PM Trips				
Residential (studio/1 bedroom)	199	146	44	389
Residential (2 or more bedrooms)	536	393	118	1,047
Office	1,646	1,004	308	2,959
PDR	104	64	19	187
General Retail	1,646	481	1,141	3,268
Restaurant	2,469	722	1,711	4,902
Open Space	33	-	24	57
Total PM Trips	***6,632 (51.8%)***	***2,809 (21.9%)***	***3,367 (26.3%)***	***12,808 (100.0%)***

Note: Numbers may not sum to total due to rounding.

Source: Adavant Consulting, 2016.

Average vehicle trip occupancies were applied to the auto person-trip data presented in Tables 16 and 17 in order to obtain vehicle-trip estimates for the Proposed Project. Average vehicle occupancy rates for the land uses being proposed by the Proposed Project were obtained from U.S. Census Bureau[21] and the *SF Guidelines* for land uses located within Superdistrict 1 and Superdistrict 3. For the open space, data collected at Heron's Head Park provided an average vehicle occupancy of 1.05 for open space. The external vehicle-trip generation results for the daily, AM peak hour and PM peak hour periods are summarized in **Table 18**.

The Maximum Residential Scenario would generate 31,016 external daily vehicle-trips on a typical weekday, 3,254 vehicle-trips (60 percent inbound / 40 percent outbound) during the AM peak hour, and 3,930 vehicle-trips (48 percent inbound / 52 percent outbound) during the PM peak hour. The Maximum Commercial Scenario would generate 34,790 external daily vehicle trips on a weekday, 3,438 vehicle-trips (73 percent inbound / 27 percent outbound) during the AM peak hour, and 3,924 vehicle-trips (37 percent inbound / 63 percent outbound) during the PM peak hour. The two scenarios generate a similar total number of trips. The Maximum Commercial Scenario would generate 3,776 (13 percent) additional daily external vehicle trips than the Maximum Residential Scenario, 184 (6 percent) additional external vehicle-trips during the AM peak hour, and 6 (0 percent) fewer external vehicle-trips during the PM peak hour. This similarity in trip generation is because the two scenarios are roughly the same size. However, the inbound/outbound split of traffic in the Maximum Residential Scenario is more balanced during the peak hours than in the Maximum Commercial Scenario.

[21] U.S. 2009-2013 American Community Survey 5-Year Estimates. Vehicle occupancy data obtained from Census Tract 226 which corresponds to the Proposed Project area.

TABLE 18: PROPOSED PROJECT VEHICLE TRIP GENERATION

Land Use	Vehicle Trips		
	Daily	AM Peak Hour	PM Peak Hour
Maximum Residential Scenario			
Residential (studio/1 bedroom)	2,179	382	403
Residential (2 or more bedrooms)	5,883	1,031	1,087
Office	4,871	602	525
PDR	632	78	68
General Retail	8,664	285	726
Restaurant	8,664	835	1,089
Open Space	122	41	32
28-Acre Site	26,865	2,726	3,309
Illinois Parcels	4,151	528	621
Total	***31,016***	***3,254***	***3,930***
Inbound	15,508 (50%)	1,951 (60%)	1,883 (48%)
Outbound	15,508 (50%)	1,303 (40%)	2,047 (52%)
Maximum Commercial Scenario			
Residential (studio/1 bedroom)	1,139	204	177
Residential (2 or more bedrooms)	3,065	548	478
Office	10,775	1,290	1,130
PDR	682	82	71
General Retail	9,453	337	814
Restaurant	9,554	938	1,221
Open Space	122	41	32
28-Acre Site	29,734	2,884	3,317
Illinois Parcels	5,056	554	607
Total	***34,790***	***3,438***	***3,924***
Inbound	17,395 (50%)	2,506 (73%)	1,459 (37%)
Outbound	17,395 (50%)	933 (27%)	2,465 (63%)

Note: Numbers may not sum to total due to rounding.

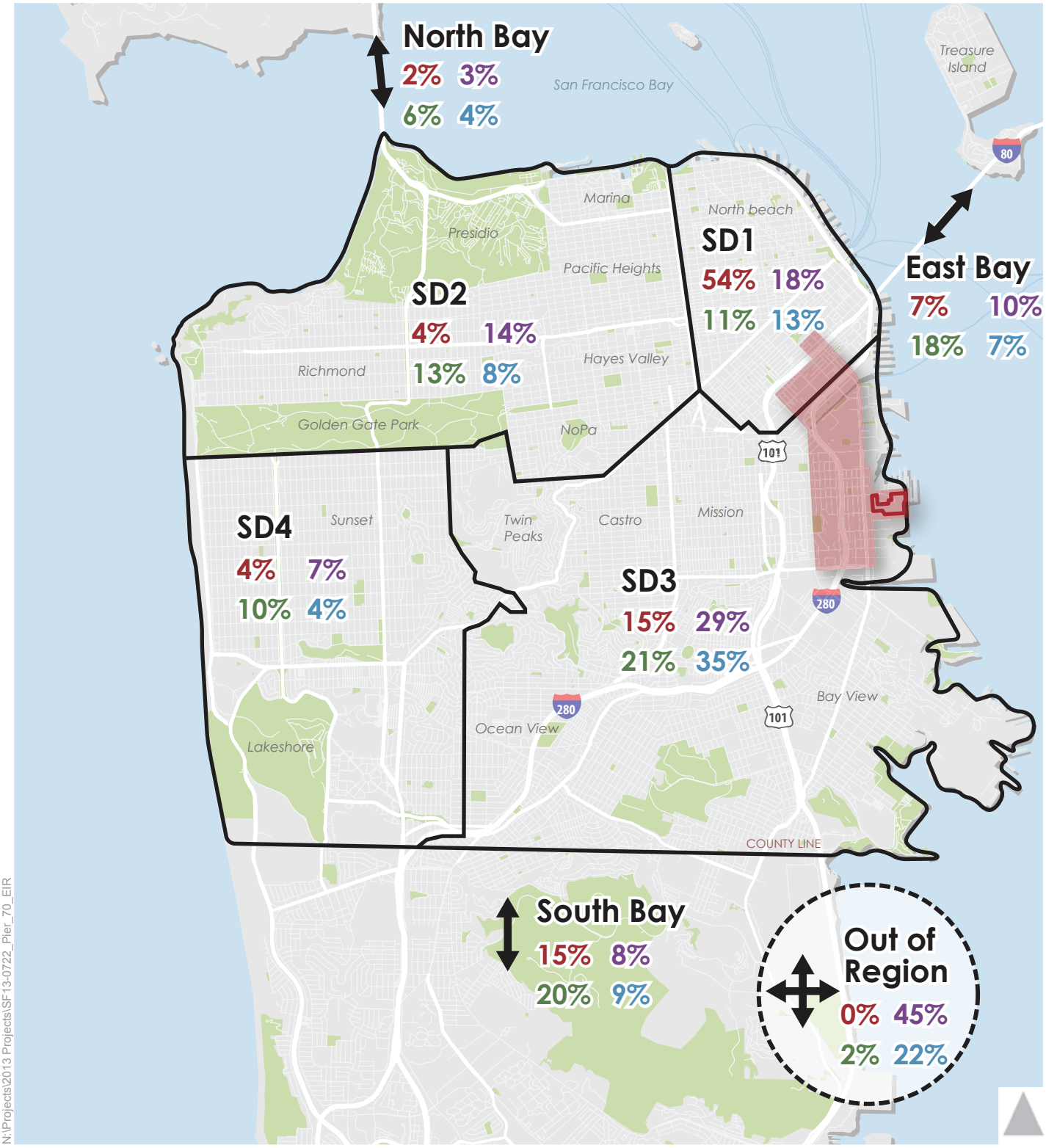
Source: Adavant Consulting, 2016.

4.4 TRIP ASSIGNMENT

The trips presented in Table 18 were assigned to the transportation network based on the percentages shown in Table 15 and on **Figure 7**. Proposed Project-generated vehicle trips were assigned to specific turning movements based on their most likely desired path to get to or from the Proposed Project. As such, the trip assignment generally reflects demand for the facilities, without much modification for potential capacity to accommodate them.

Vehicles were generally assumed to use Third Street to access the Proposed Project from the SoMa neighborhood, and areas to the north. Many of these trips also came from/went to the Embarcadero and Fourth Street. From the south and west, vehicles were assumed to use Third Street and Illinois Street to access the Proposed Project, generally via 16th Street, Mariposa Street, Cesar Chavez Street, and I-280. Trip originating from or destined for the east-west streets west of Third Street were assumed to use both Third Street and Illinois Street to access the Proposed Project. Trips from north and south of 16th Street and Cesar Chavez Street were typically assumed to use Third Street to get to the 20th Street, 21st Street, and 22nd Street access points.

The trip assignments are presented in **Figure 8A** and **Figure 8B** (for the Maximum Residential Scenario) and **Figure 9A** and **Figure 9B** (for the Maximum Commercial Scenario). Using the trip distribution percentages in **Table 15**, transit trips were assigned to specific routes based on the most direct transit route to and from the trip end.



#% Residential Trips

#% Retail/Restaurant/Office Employees

#% Office/ Restaurant Visitors

#% Retail Visitors/ Open Space

Project Site

Study Area

Figure 7

Trip Distribution



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Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign

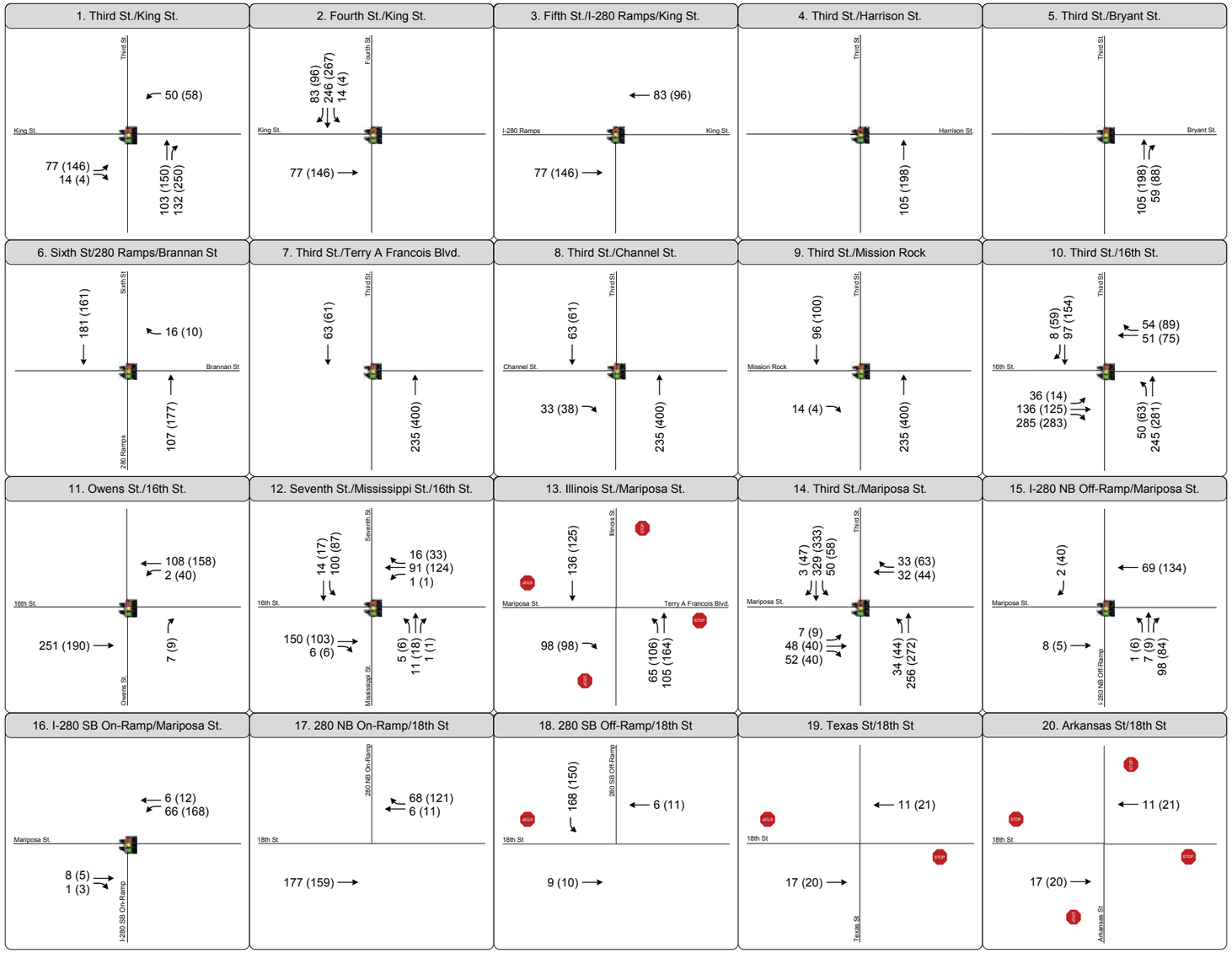
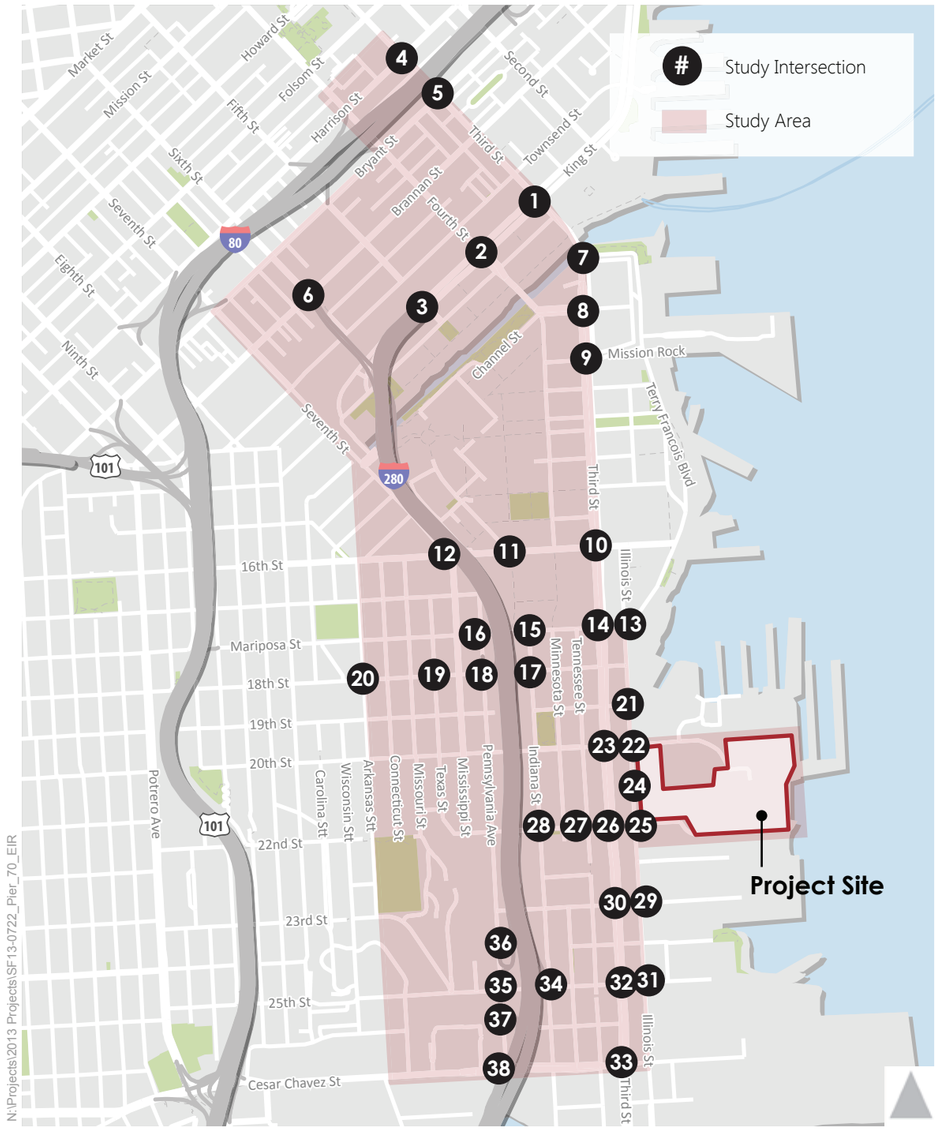


Figure 8A

Trip Assignment - Maximum Residential Scenario



Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign

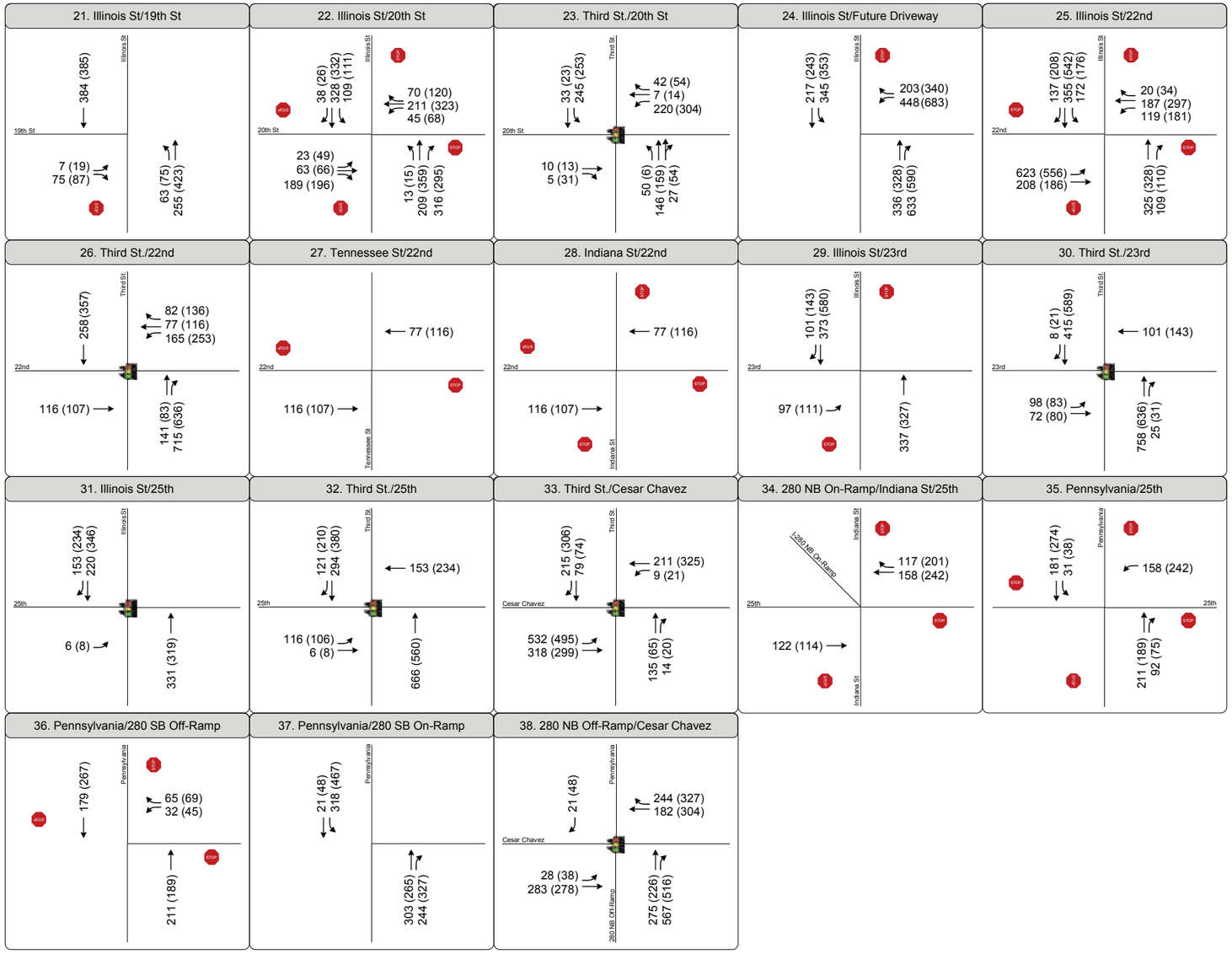
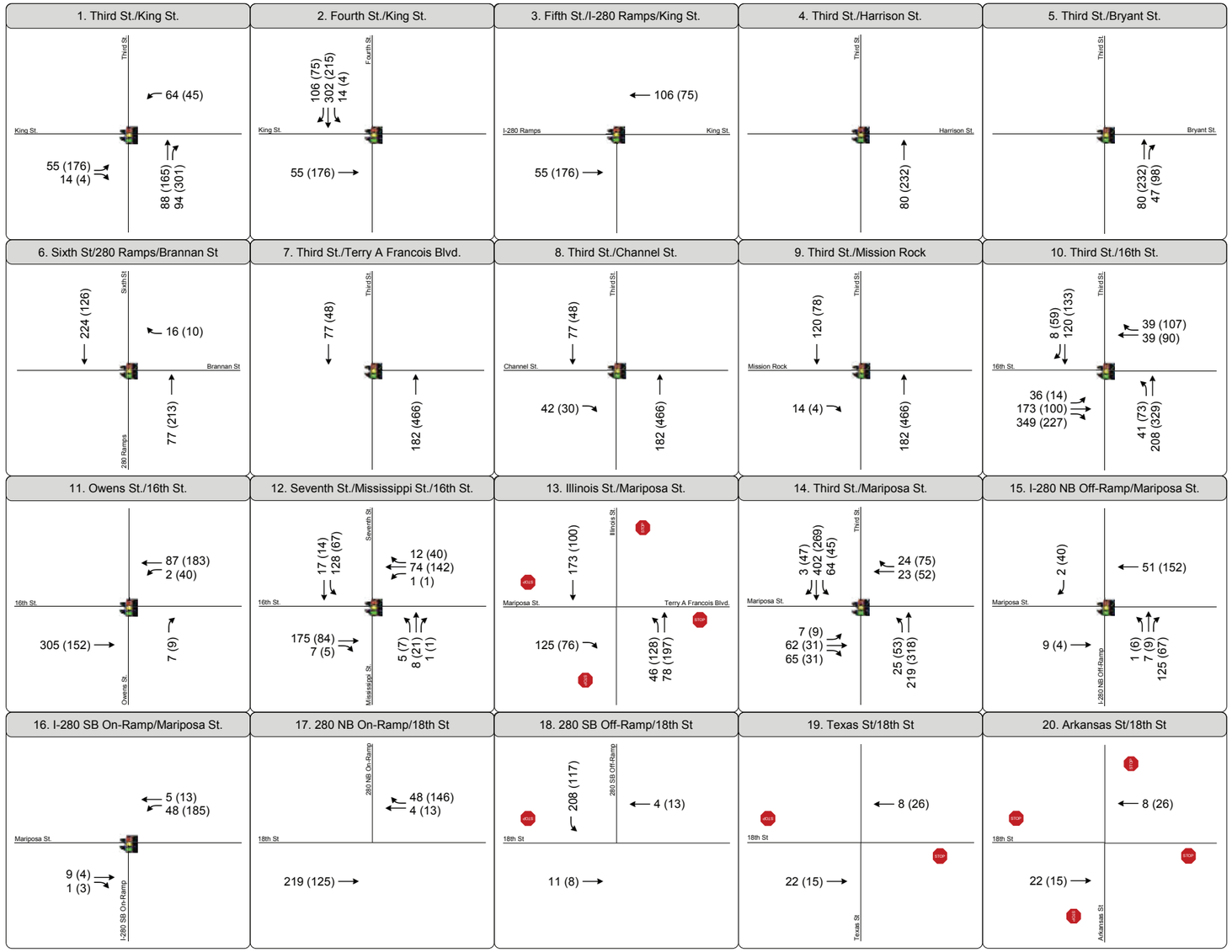


Figure 8B

Trip Assignment - Maximum Residential Scenario

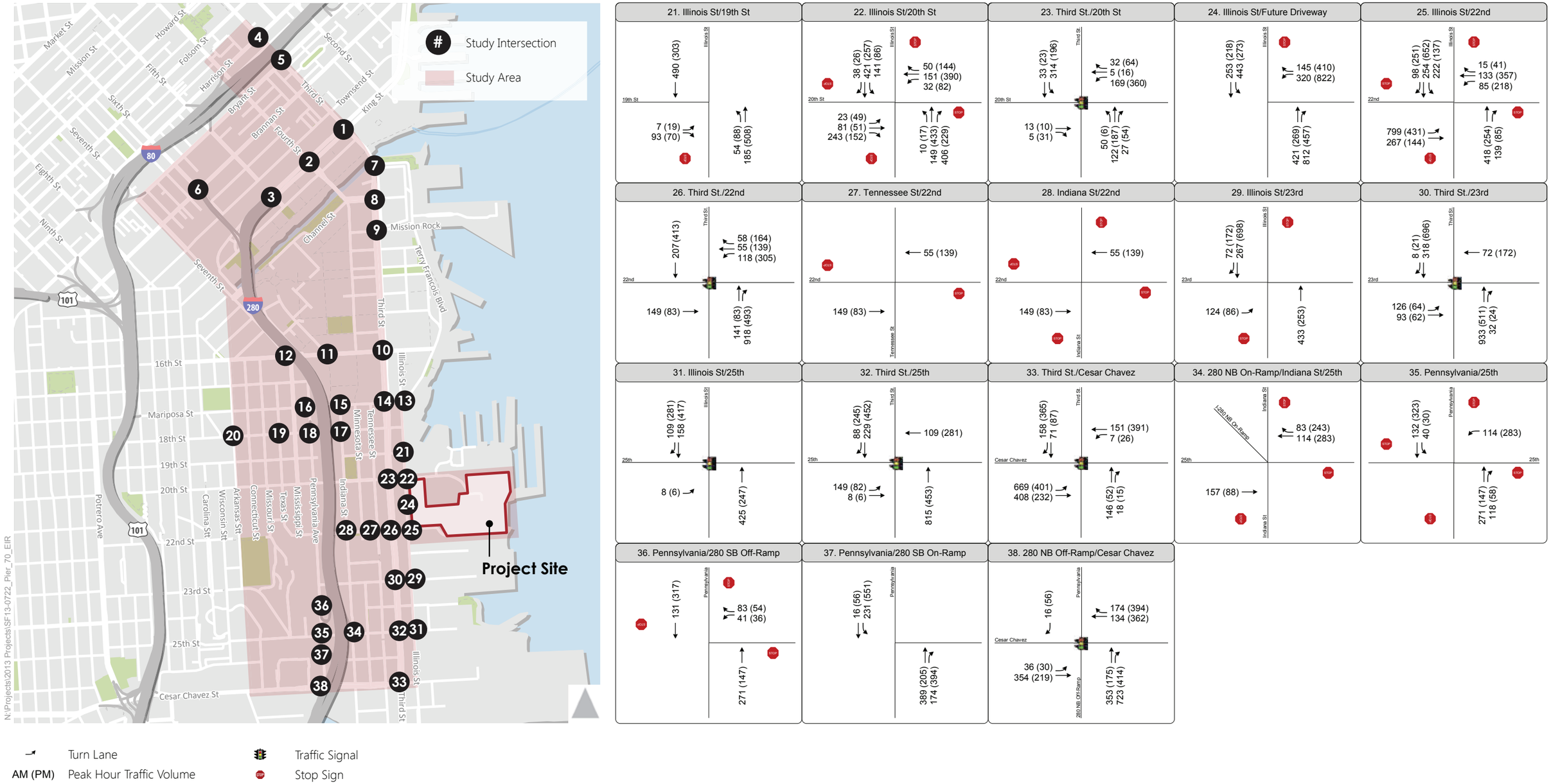




Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign

Figure 9A

Trip Assignment - Maximum Commerical Scenario



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 9B

Trip Assignment - Maximum Commercial Scenario

4.5 FREIGHT DELIVERY AND SERVICE DEMAND

The delivery/service vehicle demand forecasts are based on the methodology and truck trip generation rates presented in the *SF Guidelines*. Delivery/service vehicle demand is based on the types and amount of land uses. As shown in **Table 19**, the Proposed Project would generate a demand for 642and 856 daily delivery/service vehicle-trips for the residential and commercial scenarios, respectively, consisting primarily of small trucks and vans. This corresponds to a peak demand for 30 to 40 loading spaces during an average hour of loading activities and 37 to 50 loading spaces during the peak hour of loading activities. Again, the Maximum Commercial Scenario creates the greatest demand for truck trips and loading spaces.

TABLE 19: PROPOSED PROJECT DELIVERY/SERVICE VEHICLE TRIPS AND LOADING DEMAND

Land Use	Size	Daily Truck Generation Rate	Daily Truck Generation	Average Hour Loading Space Demand	Peak Hour Loading Space Demand
Maximum Residential Scenario					
Residential	3,025 units	0.03	79	4	5
Office/PDR	1,102,250 gsf	0.21	262	12	13
Retail	269,495 gsf	0.22	59	3	3
Restaurant	67,375 gsf	3.60	243	11	14
TOTAL	**-**	**-**	**642**	**30**	**37**
Maximum Commercial Scenario					
Residential	1,645 units	0.03	43	2	2
Office/PDR	2,262,350 gsf	0.21	505	23	29
Retail	275,075 gsf	0.22	61	3	4
Restaurant	68,765 gsf	3.60	248	11	14
TOTAL	**-**	**-**	**856**	**40**	**50**

Notes:

Numbers may not sum to total due to rounding.

1. *SF Guidelines*, Table H-1.

Source: *SF Guidelines*, 2002; Adavant Consulting, 2016.

5 PROJECT IMPACT ANALYSIS

This chapter presents the assessment of transportation impacts resulting from the travel demand generated by the Proposed Project. The impacts are grouped into seven potential impact areas: (1) traffic, (2) transit, (3) bicycles, (4) pedestrian, (5) loading, (6) emergency access and (7) construction impacts. This chapter also includes a discussion of parking conditions for informational purposes. Impact areas were analyzed for the Baseline Plus Project Conditions by adding net Proposed Project travel demand associated with the Proposed Project to Baseline Conditions.

5.1 SIGNIFICANCE CRITERIA

The significance criteria listed below are organized by mode to facilitate the transportation impact analysis; however, the transportation significance thresholds are essentially the same as the ones in the environmental checklist (Appendix G of the State *CEQA Guidelines*) and within the SF Planning Commission Resolution 19579 (and supporting materials). For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the proposed project would result in a significant impact on transportation and circulation:

5.1.1 Traffic

In January 2016, the State of California Office of Planning and Research (OPR) published for public review and comment a *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* recommending that transportation impacts for projects be measured using a vehicle miles traveled (VMT) metric. On March 3, 2016, in anticipation of the future certification of the revised CEQA Guidelines, the San Francisco Planning Commission adopted OPR's recommendation to use the VMT metric instead of automobile delay to evaluate the transportation impacts of projects (Resolution 19579). The VMT metric does not apply to the analysis of impacts on non-automobile modes of travel such as riding transit, walking and bicycling. Automobile delay information is still presented in Chapter 7 for informational purposes only.

Vehicle Miles Traveled (VMT)

- The project would have a significant effect on the environment if it would cause substantial additional VMT.
- The project would have a significant effect on the environment if it would substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network.

For residential projects, a project would generate substantial additional VMT if it exceeds the regional household VMT per capita minus 15 percent. For office projects, a project would generate substantial additional VMT if it exceeds the regional VMT per employee minus 15 percent. For retail projects, the Planning Department uses a VMT efficiency metric approach: a project would generate substantial additional VMT if it exceeds the regional VMT per retail employee minus 15 percent.

For mixed-use projects, each proposed land use is evaluated independently, per the significance criteria described above. For the Proposed Project, the PDR uses have been assumed to have the same travel characteristics – and thus the same VMT characteristics - as the office development given that trips associated with PDR typically function similar to office. Restaurant and open space uses have been assumed to have the same travel characteristics – and

thus the same VMT characteristics - as retail development, but in distinct ways. Restaurants are a subset of the retail land use category, and therefore are considered to have the same characteristics of this use, somewhat by definition. Also similar to retail, as more open space is developed throughout the city, residents travel shorter distances to visit the nearest park. As a result, VMT reductions occur as more parks are built, similar to the way local-serving retail developments serve to reduce VMT. As documented in the *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* ("proposed transportation impact guidelines"), a 15 percent threshold below existing development is "both reasonably ambitious and generally achievable."

New roadways within the Proposed Project site would not be considered a traffic-inducing impact because they simply serve to connect the Proposed Project to the existing roadway network.

Traffic

A project would have a significant adverse impact if it would cause major traffic hazards.

5.1.2 Transit

A project would have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in delays or operating costs such that significant adverse impacts in transit service levels could result. With the Muni and regional transit screenlines analyses, the project would have a significant effect on the transit provider if project-related transit trips would cause the capacity utilization standard to be exceeded during the peak hour. For screenlines that already operate above the utilization standard during the peak hour, a project would have a significant effect on the transit provider if project-related transit trips were more than five percent of total transit trips during the peak hour.

5.1.3 Pedestrians

A project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

5.1.4 Bicycles

A project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

5.1.5 Loading

A project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site loading facilities or within convenient on-street loading zones, and if it would create potentially hazardous traffic conditions or significant delays affecting traffic, transit, bicycles or pedestrians.

5.1.6 Emergency Access

The Proposed Project would have a significant effect on the environment if it would result in inadequate emergency access.

5.1.7 Construction

Construction of the project would have a significant effect on the environment if, in consideration of the project site location and other relevant project characteristics, the temporary construction activities' duration and magnitude would result in substantial interference with pedestrian, bicycle, or vehicle circulation and accessibility to adjoining areas thereby resulting in potentially hazardous conditions.

5.2 TRAFFIC IMPACTS

5.2.1 Vehicle-Miles Traveled (VMT) Estimates

Transportation is a major contributor to greenhouse gas emissions and a direct result of population and employment growth, which generates vehicle trips to move goods, provides public services, and connects people with work, school, shopping, and other activities. Growth in travel (especially vehicle travel) is due in large part to urban development patterns (i.e., the built environment).

A performance measure used to quantify the amount of travel is vehicle-miles traveled (VMT). VMT is also an important input to GHG analysis since the amount of travel and conditions under which the travel occurs directly relate to how much fuel vehicles burn. One combusted gallon of gas from a vehicle is equal to approximately 24 pounds of carbon dioxide. Given today's average vehicle fuel mileage (i.e., approximately 22 miles per gallon), one mile of travel equates to about one pound of carbon dioxide. As a result, increases in VMT directly cause increases in greenhouse gas emissions and air pollution.

Many factors affect travel behavior. These factors include density, diversity of land uses, design of the transportation network, access to regional destinations, distance to high-quality transit, development scale, demographics, and transportation demand management. Typically, low-density development at great distance from other land uses, located in areas with poor access to non-private vehicular modes of travel, generate more automobile travel compared to development located in urban areas, where a higher density, mix of land uses, and travel options other than private vehicles are available.

Given these travel behavior factors, San Francisco has a lower VMT ratio than the nine-county San Francisco Bay Area region. In addition, some areas of the City have lower VMT ratios than other areas of the City. These areas of the City can be expressed geographically through transportation analysis zones (TAZ). Transportation analysis zones are used for transportation analysis and modeling exercises. The zones vary in size from single city blocks in the downtown core, multiple blocks in outer neighborhoods, to even larger zones in historically industrial areas like the Hunters Point Shipyard. The Proposed Project site straddles multiple TAZs; VMT for TAZ 559 is used to identify the Proposed Project's impacts, as the majority of the Proposed Project sits within this TAZ.

VMT measurement has one primary limitation: it is not directly observed and therefore cannot be directly measured. It is calculated based on the number of cars multiplied by the distance traveled by each car. The amount of VMT can be obtained through extensive surveys of residents, visitors, and employees, or using a validated travel demand model that estimates vehicle demand. VMT estimates derived from travel demand forecasting (TDF) models are

dependent on the level of detail in the network and other variables related to vehicle movement through the network. The volume of traffic and distance travelled depends on land use types, density/intensity, and patterns as well as the supporting transportation system.

The San Francisco County Transportation Authority (Transportation Authority) uses the San Francisco Chained Activity Model Process (SF-CHAMP) to estimate VMT by private automobiles and taxis for different land use types. Travel behavior in SF-CHAMP is calibrated based on observed behavior from the California Household Travel Survey 2010-2012. Census data regarding automobile ownership rates and county-to-county worker flows, and observed vehicle counts and transit boardings. SF-CHAMP uses a synthetic population, which is a set of individual actors that represents the Bay Area's actual population, who make simulated travel decisions for a complete day. The Transportation Authority uses tour-based analysis for office and residential uses, which examines the entire chain of trips over the course of a day, not just trips to and from the Proposed Project. For retail uses, the Transportation Authority uses trip-based analysis. A trip-based approach, as opposed to a tour-based approach, is necessary for retail projects because a tour is likely to consist of trips stopping in multiple locations, and the summarizing of tour VMT to each location would over-estimate VMT.

For residential development, the regional average daily household VMT per capita is 17.2. For office and retail development, regional average daily work-related VMT per employee is 19.1 and 14.9, respectively. **Table 20** shows these values, as well as the values for the region minus 15 percent and the transportation analysis zone in which the Proposed Project site is located, TAZ 559.

TABLE 20: DAILY VEHICLE-MILES TRAVELED

	Regional VMT Average Per Capita	Regional Average Minus 15%	TAZ 559 (Project)
Households (Residential)	17.2	14.6	8.8
Employment (Office)	19.1	16.2	14.6
Visitors (Retail)	14.9	12.6	10.8

Source: SF-CHAMP 2015, Fehr & Peers 2015, San Francisco Planning Department 2016.

As mentioned above, existing average daily household VMT per capita is 8.8 for the transportation analysis zone the Proposed Project site is located in, TAZ 559. This is 49% below the existing regional average daily household VMT per capita of 17.2. Given that the Proposed Project site is located in an area where existing VMT is more than 15 percent below the existing regional average, the Proposed Project's residential uses would not result in substantial additional VMT and impacts would be **less-than-significant**.

Existing average daily work-related VMT per employee is 14.6 for office uses in the transportation analysis zone for the Proposed Project site. This is 24% below the existing regional average daily work-related VMT per employee for office uses of 19.1. Given that the Proposed Project site is located in an area where existing VMT per capita is more than 15 percent below the existing regional average, the Project's office and PDR uses would not result in substantial additional VMT and impacts would be **less-than-significant**.

Finally, existing average retail daily work-related VMT per employee is 10.8 for the transportation analysis zone for the Proposed Project site. This is 28% below the existing regional average retail daily work-related VMT per employee of 14.9. Given that the Proposed Project site is located in an area where existing retail VMT per capita is

more than 15 percent below the existing regional average, the Proposed Project's retail, restaurant, and open space uses would not result in substantial additional VMT and impacts would be **less-than-significant**.

This analysis indicates that residents of Pier 70 would make much shorter vehicle trips than Pier 70 employees and visitors, on average. Residents would tend to make more trips within the City of San Francisco, while a greater share of employees and visitors would be traveling to the site from origins outside the City including the South Bay and East Bay. Employment centers generally draw equally from the regional resident pool, meaning every resident is equally drawn to employment centers. Because the location of the Proposed Project is close to major regional employment centers (i.e. Downtown San Francisco) this will reduce average trip lengths for residents. However, employees will be drawn from around the region. Therefore, the per capita VMT impact of Pier 70 residents is much lower than the per capita VMT impact of Pier 70 employees and visitors. This is not surprising given the close proximity of the site to I-280 on- and off-ramps, facilitating vehicle travel to the site from other parts of the Bay Area region. As a result, the Maximum Commercial Scenario would generate more VMT than the Maximum Residential Scenario.

5.2.2 Induced Travel

The Proposed Project is not a transportation project. However, the Proposed Project would include features that would change the transportation network in the Proposed Project study area. These features would be sidewalk widening on adjacent streets, on-street loading zones, curb cuts, and on-street safety strategies and intersection signalization. These features fit within the general types of projects identified that would not substantially induce automobile travel. Therefore, impacts would be **less-than-significant**.

5.2.3 Other Traffic Hazard Issues

The Proposed Project would also have a significant impact to traffic if it created or contributed to a major traffic hazard in the study area. In general, the Proposed Project would add vehicle trips to the surrounding roadways; however, a general increase in traffic in and of itself would not be considered a traffic hazard.

Existing vehicle, pedestrian, and bicycle volumes on Illinois Street, 20th Street, 22nd Street, and other streets near the Proposed Project are low (with the exception of Third Street), though the project-related impacts on the proposed circulation network have been reflected in the intersection analysis. Vehicle queues at the Proposed Project driveways into the public right-of-way would be subject to the Planning Department's vehicle queue abatement Conditions of Approval (see **Appendix F** and Potential Measure TR-3 (RES/COM): Queue Abatement in Section 5.4.1). The Proposed Project's new internal street system is currently under development; however, the final designs will be subject to approval by the SFMTA, San Francisco Fire Department, and the San Francisco Department of Public Works to ensure that the streets are designed consistent with City policies and design standards. Therefore, the Proposed Project's impacts to traffic hazards are expected to be **less-than-significant**.

5.2.4 Measures Identified for the Proposed Project

Chapter 7 of this report includes a detailed traffic analysis conducted for informational and site planning purposes. Although the results of that analysis are not relevant to the Proposed Project's environmental review and no significant impacts are identified associated with that analysis, the traffic analysis did result in some recommendations for project refinements that are summarized here (note that the numbering does not begin at

TR-1, as these measures are described in more detail later in this document and the numbering reflects their position later in this report):

Potential Measure TR-8: Convert Existing Signal at 20th Street / Illinois Street from All-Way Stop Operation (Flashing Red) to Conventional Signal Operation

To improve poor operating conditions at the intersection, the SFMTA could operate the signal at this intersection, which currently operates in "flashing red" mode, signalizing an all-way stop, to be a conventional signal. With this change, this intersection would continue to operate unacceptably in the AM and PM peak hours, though operations would be improved. The Project Sponsor shall pay their fair share of the cost to install this potential measure. (Note that this Potential Measure to improve traffic circulation is also included as a Mitigation Measure to improve pedestrian safety and circulation, as discussed in Section 5.1.3.)

Potential Measure TR-9: Install and Operate Signal at 21st Street / Illinois Street

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate at LOS F in the AM and PM peak hours, though operations would be improved. The Project Sponsor shall pay their fair share of the cost for this potential measure. (Note that this Potential Measure to improve traffic circulation is also included as a Mitigation Measure to improve pedestrian safety and circulation, as discussed in Section 5.1.3.)

Potential Measure TR-10: Install and Operate Signal at 22nd Street / Illinois Street

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate at LOS F in the AM and PM peak hours, though operations would be improved. The Project Sponsor shall pay their fair share of the cost for this potential measure. (Note that this Potential Measure to improve traffic circulation is also included as a Mitigation Measure to improve pedestrian safety and circulation, as discussed in Section 5.1.3.)

Potential Measure TR-11: Install and Operate Signal at 25th Street / Indiana Street / I-280 Northbound On-Ramp

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B or better during both peak hours. The Project Sponsor shall pay their fair share of the cost for this potential measure.

Potential Measure TR-12: Install and Operate Signal at 25th Street / Pennsylvania Street

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would improve to acceptable LOS B in the AM peak hour. However, the intersection would still operate at LOS F in the PM peak hour. The Project Sponsor shall pay their fair share of the cost for this potential measure.

Potential Measure TR-13: Install and Operate Signal at Pennsylvania Street / I-280 Southbound Off-Ramp

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B in the PM peak hour. The Project Sponsor shall pay their fair share of the cost for this potential measure.

5.3 TRANSIT IMPACTS



Transit impacts were evaluated based on the ability of the transit system to handle existing and projected future ridership demands. Most transit users would travel between the Proposed Project site and the nearest transit stop/station by foot.

The Proposed Project would generate 2,665 transit trips in the AM peak hour and 2,893 during the weekday PM peak hour in the Maximum Residential Scenario. The Proposed Project would generate 2,818 transit trips in the AM peak hour and 2,809 during the weekday PM peak hour in the Maximum Commercial Scenario. Transit trips to and from the Proposed Project would use nearby Muni lines (T Third, 10 Townsend, 22 Fillmore, or 48 Quintara/24th Street), as well as regional providers such as Caltrain, SamTrans, AC Transit, Golden Gate Transit, and BART.

5.3.1 Proposed Shuttle Service

The Project sponsor is proposing a shuttle service, operated and maintained by the Pier 70 TMA, to connect the Pier 70 Mixed-Use District to regional transit hubs, like the Transbay Transit Center, 22nd Street Caltrain Station, and 16th Street/ Mission BART station. The primary goal of the proposed shuttle service at Pier 70 is to provide a first-mile / last-mile connection for transit riders traveling to or from the site, particularly for riders looking to access frequent local and regional transit. These riders would be expected to take regional transit services operated by BART, Caltrain, AC Transit, Golden Gate Transit, SamTrans, or other regional transit providers, but would need an additional connection to access these services when traveling to or from Pier 70.

The exact structure of any shuttle service provided for the Proposed Project site is variable at this stage and dependent on factors that may not be known at this time. At minimum, shuttle service should be provided that connects the two or three stops within the Proposed Project site to both BART (16th Street / Mission Station) and Caltrain (both 22nd Street Station and Fourth and King Station). These agencies are the primary regional transit providers expected to serve transit ridership generated by the Proposed Project and encourage transit use over single occupancy auto use. Exact routes and operating schemes can be determined at a later time, dependent on factors such as peak-period traffic congestion along specific streets and BART and Caltrain service plans and schedules at specific stations. However, the service would at least be provided at 15-minute headways during the extended weekday commute periods (7:00 AM to 10:00 AM and 3:00 PM to 7:00 PM) and would function as a bi-directional service, reflecting the mixed-use residential and commercial nature of the Proposed Project.

For planning purposes, two routes have been preliminarily identified, although actual service routes and stops would be determined based on rider feedback and demand. The two preliminary routes are:

- 22nd Street, Mississippi Street, and 16th Street to access the 22nd Street Caltrain Station and the 16th Street / Mission BART station

- Third Street, 16th Street, and King Street to access the Fourth and King Caltrain Station (with some trips extending to the Transbay Transit Center)

While these riders would have the option of taking local transit services operated by Muni, the shuttle system would offer complimentary service to meet the needs of these users, similar to the way in which the Mission Bay TMA[22] shuttle system enhances existing Muni service. For context, a Transportation Management Association (TMA) is "a formal organization of businesses and local governments dedicated to solving local transportation concerns. TMAs usually focus on the travel needs of large employers, and are often created to give businesses a voice in local government transportation planning, to advocate enhanced mobility, and to reduce employer costs of implementing individual worksite transportation programs through economies of scale." [23] For the purposes of this analysis, residents and employees at the Proposed Project were forecasted to use the shuttle to get to the regional transit service hubs (e.g. 16th Street/Mission BART station and 22nd Street Caltrain station), but this would not replace or duplicate Muni service for local trips. The proposed fifteen-minute headways of the shuttles would be similar to the existing 10 Townsend, 22 Fillmore, or 48 Quintara/24th Street headways, though the shuttle service would be free to residents and employees.

The Pier 70 commuter shuttle would fall within the SFMTA Commuter Shuttle Program. The Commuter Shuttle Program would include minor modifications to the existing arterials to install new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands, and bus bulbs.

Under the Commuter Shuttle Program, SFMTA would continue to designate, and mark with appropriate signage, select Muni zones and passenger loading zones for commuter shuttle use. In addition, the Commuter Shuttle Program through SFMTA would include installation of safety improvements to the existing right-of-way that would improve the stop network for both commuter shuttles and users of other modes. These improvements could include boarding islands, pedestrian bulbs, and bus bulbs.

Shuttles support local San Francisco and regional goals by decreasing single occupancy vehicle trips, VMT, and private vehicle ownership. The Commuter Shuttle Program Evaluation Report found that 47 percent of shuttle riders said they would drive alone to work if a shuttle were not available[23]. Based on the survey data collected for the Evaluation Report, availability of commuter shuttles influence the travel behavior for a substantial number of shuttle riders, which results in the reduction of drive-alone trips. As a result, this program received a Categorical Exemption from environmental review in October 2015.[24]

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[22] Source: http://www.nctcog.org/trans/cmp/tdm/tma.asp

[23] San Francisco Municipal Transportation Agency, *Commuter Shuttle Pilot Program Evaluation Report*, October 5, 2015, p. 6. A copy of this report is available on line at https://www.sfmta.com/sites/default/files/projects/2015/Evaluation%20Report%20-%20Oct%205%202015.pdf. Accessed July 6, 2016.

[24] San Francisco Planning Department, Certificate of Determination of Exemption from Environmental Review, SFMTA – Commuter Shuttle Program, Case No. 2015-007975ENV, October 22, 2015. Available on line at www.sfmta.com/sites/default/files/projects/2015/Commuter Shuttle Program Certificate of Exemption from Environmental Review.pdf. Accessed July 6, 2016.

5.3.2 San Francisco Muni

The additional Proposed Project-generated transit trips were assumed to follow the same geographic trip distribution patterns as Proposed Project auto trips throughout San Francisco and the region. Transit trips were assigned to the individual routes based on the likely origins and destinations of the trips and the available capacity on each route. **Table 22** and **Table 23** outline the effect of Proposed Project transit trips capacity utilization at the maximum load points (MLPs) in the AM and PM periods, respectively, for each of the downtown transit screenlines.

The Baseline Plus Project Conditions assume completion of the Central Subway, which is planned to open in 2019 and would supplement the existing Muni routes. After the service changes being implemented as part of the Muni Forward campaign, the 22 Fillmore and 33 Stanyan would provide service in the 16th Street corridor at six- to eight-minute headways and 12-minute headways, respectively, during the peak periods. These service changes were assumed in the Baseline Conditions analysis.

Based on peak hour observations, nearest Muni stops to the Proposed Project would generally provide adequate space for waiting passengers. Based on a qualitative assessment, the 22 Fillmore terminal stop at 20th Street / Tennessee Street has sufficient sidewalk space for waiting passengers, as does the 48 Quintara / 24th Street terminal at 3rd Street / 20th Street. The T Third platform at Third Street / 20th Street – which represents the highest ridership location of the three routes - had as many as 25 to 30 riders waiting during the peak periods, leaving sufficient space for additional riders waiting for Muni.

Screenlines

The Project would have a significant impact if the addition of Proposed Project trips to the specific routes serving the Proposed Project site or the standard downtown screenlines (i.e., northeast, southeast, northwest, and southwest) would cause the capacity utilization to exceed SFMTA's 85 percent operating threshold. As shown **Table 21** and **Table 22**, with the addition of the Proposed Project-generated transit trips, The addition of riders from the Proposed Project would increase capacity utilization but would not cause any of the screenlines that operate below 85 percent capacity utilization to exceed the 85 percent standard. Some sub-corridors within the screenlines will exceed 85 percent capacity utilization. Specifically, the "other lines" sub-corridor within the Southeast screenline will operate at 94 percent and 96 percent in the Maximum Residential and Maximum Commercial scenarios, respectively, in the a.m. peak hour. However, the overall screenline will operate within 85percent capacity utilization and conditions on this screenline are considered acceptable.

Capacity utilization at the southwest screenline would increase from 92 percent to 95 percent under the Maximum Residential Scenario and 96 percent under the Maximum Commercial Scenario in the a.m. peak hour. Furthermore, the "subway lines" sub-corridor within the southwest screenline will increase capacity utilization in the a.m. peak hour from 95 percent under Baseline Conditions to 101 percent and 102 percent capacity utiliziation under the Maximum Residential and Maximum Commercial scenarios, respectively. However, the Proposed Project would add less than 5 percent to the baseline ridership at the overall screenline. Therefore, because the Proposed Project would not cause any screenline to exceed its capacity utilization threshold and because the Proposed Project would not increase capacity utilization by more than five percent on any screenline forecasted to exceed its capacity utilization threshold under Baseline Conditions without the Proposed Project, the impact would be **less-than-significant** and no mitigation is required.

TABLE 21: MUNI DOWNTOWN SCREENLINES – AM PEAK HOUR

Muni Screenline	Baseline[1]			Baseline Plus Project – Residential			Baseline Plus Project – Commercial		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast									
Kearny/Stockton	2,273	3,157	72%	0	2,273	72%	0	2,273	72%
Other lines	710	1,141	62%	54	764	67%	37	747	65%
Screenline Total	*2,983*	*4,298*	*69%*	*54*	*3,037*	*71%*	*37*	*3,020*	*70%*
Northwest									
Geary	2,302	3,764	61%	0	2,302	61%	0	2,302	61%
California	1,436	2,010	71%	0	1,436	71%	0	1,436	71%
Sutter/Clement	514	630	82%	0	514	82%	0	514	82%
Fulton/Hayes	1,505	2,237	67%	0	1,505	67%	0	1,505	67%
Balboa	553	1008	55%	0	553	55%	0	553	55%
Screenline Total	*6,310*	*9,649*	*65%*	*0*	*6,310*	*65%*	*0*	*6,310*	*65%*
Southeast									
Third Street	1,025	3,808	27%	215	1,240	33%	152	1,177	31%
Mission	2,155	2,632	82%	0	2,155	82%	0	2,155	82%
San Bruno/Bayshore	1,867	2,197	85%	0	1,867	85%	0	1,867	85%
Other lines	1,577	1,756	**90%**	81	1,658	**94%**	101	1,678	**96%**
Screenline Total	*6,624*	*10,393*	*64%*	*296*	*6,920*	*67%*	*253*	*6,877*	*66%*
Southwest									
Subway lines	6,783	7,020	**97%**	323	7,106	**101%**	410	7,193	**102%**
Haight/Noriega	1,178	1,596	74%	0	1,178	74%	0	1,178	74%
Other lines	474	560	85%	0	474	85%	0	474	85%
Screenline Total	*8,435*	*9,176*	***92%***	*323*	*8,758*	***95%***	*410*	*8,845*	***96%***
Muni Screenlines Total	*24,352*	*33,515*	*73%*	*673*	*25,025*	*75%*	*700*	*25,052*	*75%*
Individual Muni Routes									
22 Fillmore IB	501	882	57%	163	664	75%	129	630	71%
22 Fillmore OB	340	882	39%	245	585	66%	350	690	78%
48 Quintara/24th Street IB	119	252	47%	149	268	**106%**	118	237	**94%**
48 Quintara/24th Street OB	199	252	79%	224	423	**168%**	319	518	**206%**
T Third IB	1,097	3,808	29%	323	1,420	37%	410	1,507	40%
T Third OB	1,931	3,808	51%	215	2,146	56%	152	2,083	55%

Notes:

Bold indicates capacity utilization of 85 percent or greater.

1. Baseline condition is a modified existing condition.

Source: Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

TABLE 22: MUNI DOWNTOWN SCREENLINES – PM PEAK HOUR

Muni Screenline	Baseline[1]			Baseline Plus Project – Residential			Baseline Plus Project – Commercial		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast									
Kearny/Stockton	2,444	3,327	73%	0	2,444	73%	0	2,444	73%
Other lines	903	1,155	78%	71	974	84%	51	954	83%
Screenline Total	*3,347*	*4,482*	*75%*	*71*	*3,418*	*76%*	*51*	*3,398*	*76%*
Northwest									
Geary	2,913	3,621	80%	0	2,913	80%	0	2,913	80%
California	1,349	1,752	77%	0	1,349	77%	0	1,349	77%
Sutter/Clement	523	630	83%	0	523	83%	0	523	83%
Fulton/Hayes	1544	1,838	84%	0	1,544	84%	0	1,544	84%
Balboa	537	974	55%	0	537	55%	0	537	55%
Screenline Total	*6,866*	*8,815*	*78%*	*0*	*6,866*	*78%*	*0*	*6,866*	*78%*
Southeast									
Third Street	1,836	3,808	48%	280	2,116	56%	208	2,044	54%
Mission	1,927	2,632	73%	0	1,927	73%	0	1,927	73%
San Bruno/Bayshore	1,761	2,134	83%	0	1,761	83%	0	1,761	83%
Other lines	1,213	1,675	72%	76	1,289	77%	87	1,300	78%
Screenline Total	*6,737*	*10,249*	*66%*	*356*	*7,093*	*69%*	*295*	*7,032*	*69%*
Southwest									
Subway lines	5,433	6,804	80%	304	5,737	84%	354	5,787	**85%**
Haight/Noriega	1,065	1,596	67%	0	1,065	67%	0	1,065	67%
Other lines	655	840	78%	0	655	78%	0	655	78%
Screenline Total	*7,153*	*9,240*	*77%*	*304*	*7,457*	*81%*	*354*	*7,507*	*81%*
Muni Screenlines Total	*24,103*	*32,786*	*74%*	*731*	*24,834*	*76%*	*700*	*24,803*	*76%*
Individual Muni Routes									
22 Fillmore IB	436	939	46%	230	666	71%	301	737	78%
22 Fillmore OB	400	939	43%	213	613	65%	177	577	61%
48 Quintara/24th Street IB	160	252	63%	211	371	**147%**	274	434	**172%**
48 Quintara/24th Street OB	213	252	85%	196	409	**162%**	161	374	**148%**
T Third IB	1,940	3,808	51%	280	2,220	58%	208	2,148	56%
T Third OB	1,742	3,808	46%	304	2,046	54%	354	2,096	55%

Notes:

Bold indicates capacity utilization of 85 percent or greater.

1. Baseline condition is a modified existing condition.

Source: Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

Individual Routes

The 22 Fillmore and T Third routes would operate within SFMTA's 85 percent utilization threshold in both the AM and PM peak hours with and without the Proposed Project. Therefore, the proposed Project's impacts to these two individual routes would be **less-than-significant**.

The 48 Quintara/24th Street would exceed the 85 percent utilization threshold under both the Baseline Plus Project (Maximum Residential Scenario) and the Baseline Plus Project (Maximum Commercial Scenario) in the AM and PM peak hours. This route would operate within the 85 percent utilization threshold under Baseline Conditions without the Proposed Project in both peak hours. Therefore, the Proposed Project's impact to Muni transit capacity along this route would be **significant** under both the Maximum Residential and Maximum Commercial scenarios in the AM and PM peak hours**.**

Under the Maximum Residential Scenario, Project-generated ridership would be 56 percent of the inbound 48 Quintara/24th Street ridership and 53 percent of the outbound ridership in the a.m. peak hour. In the p.m. peak hour, Project-generated ridership would be 57 percent of the ridership on the 48 Quintara/24th Street route in the inbound direction and 48 percent in the outbound direction.

Under the Maximum Commercial Scenario, Project-generated ridership would be 50 percent of the inbound 48 Quintara/24th Street ridership and 62 percent of the outbound ridership in the a.m. peak hour. In the p.m. peak hour, Project-generated ridership would be 63 percent of the ridership on the 48 Quintara/24th Street route in the inbound direction and 43 percent in the outbound direction.

This would be a significant impact on this Muni route under either scenario of the Proposed Project. In order to reduce this impact to less-than-significant levels, additional transit capacity along the 48 Quintara/24th Street bus route would be required.

Mitigation Measure TR-1 (RES/COM): Increase Bus Service Capacity for SFMTA

Prior to approval of phase applications, project sponsors shall demonstrate that the capacity of the 48 Quintara/24th Street bus route has not exceeded 85 percent utilization, and that future demand associated with build-out and occupancy of the phase will not cause the route to exceed its utilization. Forecasts of travel behavior of future phases could be based on trip generation rates forecast in the TIS or based on subsequent surveys of occupants of the project.

If trip generation calculations or monitoring surveys demonstrate that a specific phase of the Proposed Project will cause capacity on the 48 Quintara/24th Street route to exceed 85 percent, the project sponsors shall provide capital costs for increased capacity on the route in a manner deemed acceptable by SFMTA through the following means:

- The project sponsors shall pay the capital costs for additional buses (up to a maximum of four in the Maximum Residential Scenario and six in the Maximum Commercial Scenario). While the project sponsors could assist with purchasing the buses, SFMTA would need to find funding to pay for the added operating cost associated with operating increased service made possible by the increased vehicle fleet. The source of that funding has not been established.

Alternatively, if SFMTA determines that other measures to increase capacity along the route would be more desirable than adding vehicles, the project sponsors shall pay an amount equivalent to the cost of

the required number of buses toward completion of one or more of the following, as determined by SFMTA:

- Convert to using higher-capacity vehicles on the 48 Quintara/24th Street route. In this case, the project sponsors shall pay a portion of the capital costs to convert the route to articulated buses. Some bus stops along the route may not currently be configured to accommodate the longer articulated buses. Some bus zones could likely be extended by removing one or more parking spaces; in some locations, appropriate space may not be available. The project sponsors' contribution may not be adequate to facilitate the full conversion of the route to articulated buses; therefore, a source of funding would need to be established to complete the remainder, including improvements to bus stop capacity at all of the bus stops along the route that do not currently accommodate articulated buses.
- SFMTA may determine that instead of adding more buses to a congested route, it would be more desirable to increase travel speeds along the route. In this case, the project sponsors' contribution would be used to fund a study to identify appropriate and feasible improvements and/or implement a portion of the improvements that would increase travel speeds sufficiently to increase capacity along the bus route such that the project's impacts along the route would be determined to be less than significant. Increased speeds could be accomplished by funding a portion of the planned bus rapid transit system along 16th Street for the 22 Fillmore between Church and Third streets. Adding signals on Pennsylvania Street and 22nd Street may serve to provide increased travel speeds on this relatively short segment of the bus routes. The project sponsors' contribution may not be adequate to fully achieve the capacity increases needed to reduce the project's impacts and SFMTA may need to secure additional sources of funding.
- Another option to increase capacity along the corridor is to add new a Muni service route in this area. If this option is selected, project sponsors shall fund purchase of the same number of new vehicles outlined in the first option (four for the Maximum Residential Alternative and six for the Maximum Commercial Alternative) to be operated along the new route. By providing an additional service route, a percentage of the current transit riders on the 48 Quintara/24th Street would likely shift to the new route, lowering the capacity utilization below the 85 percent utilization threshold. As for the first option, funding would need to be secured to pay for operating the new route.

Implementing any of the components of Mitigation Measure TR-1 would allow Muni to maintain transit headways, and would reduce the Proposed Project's impact to less-than-significant levels. Implementation of features of the mitigation measure above that would require discretionary approval actions by the SFMTA or other public agencies (including allocation of funds to operate increased frequencies) is considered uncertain because public agencies subject to CEQA cannot commit to implementing any part of a proposed project, including proposed mitigation measures, until environmental review is complete. Thus, while the SFMTA has reviewed the feasibility of the options listed above, implementation of these measures cannot be assured until after certification of the Proposed Project's environmental review. Because it is unknown whether Mitigation Measure TR-1 would be implemented, project-related impacts on the 48 Quintara/24th Street would be **significant and unavoidable**.

For the impacted line, the level of future growth attributable to the Proposed Project that would create the significant transit impact was determined. This was done for both the Maximum Residential Scenario and Maximum Commercial Scenario during both the AM and PM peak hours. In order to ensure that Mitigation Measure would be implemented prior to the significant impact under either of the development scenarios, the lower level of growth amongst the two scenarios was selected as the threshold for each location for AM and PM peak hour. The proposed measures threshold and monitoring plan is attached to this report in **Appendix G**.

As noted in the Mitigation Measure language, based on the thresholds and the effective transit trip generation rates, the Project Sponsor shall be required by the Planning Department to demonstrate with each phase application whether the transit trips generated by the land use cumulatively proposed as a result of that application would cause any of the trip generation thresholds to be met, and if so, to provide the capital costs for the additional buses prior to occupancy of buildings within that application.

Alternatively, the Project Sponsor may demonstrate that transit trip generation is occurring at a lower rate than originally predicted through counts and/or employee and residential surveys. If transit trip generation is shown to be lower than estimated by the EIR calculations, mitigations can be delayed until warranted based on the observed rates and trips. The total trip generation thresholds would remain the same. The City (the Planning Department and/or the SFMTA) would need to approve on the transit trip generation methodology prior to the Project Sponsor conducting the surveys.Overall, two of the primary routes serving the study area (the T Third and the 22 Fillmore) would operate in dedicated rights-of-way and therefore are not likely to be affected by project-related traffic congestion. The 48 Quintara/24th Street will not operate on major streets in the vicinity of the Proposed Project and as such, its route is not likely to be affected by project-generated traffic congestion either. Thus, the Proposed Project's impacts on transit delay are expected to be minor and are not discussed in detail in this analysis.

5.3.3 Regional Transit

The Proposed Project would add new transit trips to regional transit providers (BART, Caltrain, SamTrans, Golden Gate Transit, and AC Transit), including as many as 208 transit trips to the East Bay, 589 transit trips to the South Bay, and 80 transit trips to the North Bay during the peak hours. This represents approximately one to two percent of existing regional transit ridership. The East Bay regional screenline would exceed its capacity utilization threshold in the AM peak hour. However, the Proposed Project would not increase the ridership by more than 5 percent during the AM peak hour. The East Bay regional screenline would not exceed its capacity utilization threshold in the PM peak hour with the addition of project-related trips. None of the other regional screenlines would exceed capacity utilization standards in either the AM or PM peak with the addition of project-generated trips. Therefore, the Proposed Project would have a **less-than-significant** impact to regional transit capacity, as shown in **Table 23** and **Table 24.**

TABLE 23: REGIONAL TRANSIT SCREENLINES – PROJECT CONDITIONS (AM PEAK HOUR)

Regional Screenline	Baseline (Inbound)			Baseline Plus Project – Residential (Inbound)			Baseline Plus Project – Commercial (Inbound)		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay									
BART	28,000	25,680	**109%**	137	28,137	**110%**	177	28,177	**110%**
AC Transit	1,596	2,829	56%	16	1,612	57%	21	1,617	57%
Ferries	818	1,170	70%	8	8126	71%	10	828	71%
Screenline Total	30,414	29,679	**102%**	*161*	*30,575*	***103%***	*208*	*30,622*	***103%***
North Bay									
Golden Gate Transit Bus	1,344	2,543	53%	66	1,410	55%	80	1,424	56%
Ferries	1,088	1,959	56%	0	1,088	56%	0	1,088	56%
Screenline Total	*2,432*	*4,502*	*54%*	*66*	*2,498*	*55%*	*80*	*2,512*	*56%*
South Bay									
BART	16,000	21,400	75%	53	16,053	75%	61	16,061	75%
Caltrain	2,258	3,100	73%	435	2,693	87%	516	2,774	89%
SamTrans	266	520	51%	11	277	53%	12	278	53%
Screenline Total	18,524	25,020	74%	*499*	*19,023*	*76%*	*589*	*19,113*	*76%*
Regional Screenlines Total	51,370	59,201	87%	*726*	*52,096*	*88%*	*877*	*52,247*	*88%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

1. Baseline condition is a modified existing condition.

Source: Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

TABLE 24: REGIONAL TRANSIT SCREENLINES – PROJECT CONDITIONS (PM PEAK HOUR)

Regional Screenline	Baseline (Outbound)			Baseline Plus Project – Residential (Outbound)			Baseline Plus Project – Commercial (Outbound)		
	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay									
BART	27,000	25,680	**105%**	119	27,119	**106%**	89	27,089	**105%**
AC Transit	2,297	3,926	59%	14	2,311	59%	11	2,308	59%
Ferries	813	1,615	50%	7	820	51%	5	818	51%
Screenline Total	30,110	31,221	96%	*140*	*30,250*	*97%*	*105*	*30,215*	*97%*
North Bay									
Golden Gate Transit Bus	1,399	2,817	50%	62	1,461	52%	69	1,468	52%
Ferries	973	1,959	50%	0	973	50%	0	973	50%
Screenline Total	*2,372*	*4,776*	50%	*62*	2,434	51%	*69*	2,441	51%
South Bay									
BART	15,000	21,400	70%	46	15,046	70%	31	15,031	70%
Caltrain	2,472	3,100	80%	379	2,851	92%	261	2,733	88%
SamTrans	147	320	46%	9	156	49%	6	153	48%
Screenline Total	*17,619*	*24,820*	*71%*	*434*	*18,053*	*73%*	*298*	*17,917*	*72%*
Regional Screenlines Total	*50,101*	*60,817*	*82%*	*631*	*50,732*	*83%*	*444*	*50,545*	*83%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

1. Baseline condition is a modified existing condition.

Source: Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

5.4 PEDESTRIAN IMPACTS



Pedestrian trips generated by the Proposed Project would include walk trips to and from the local and regional transit stops, as well as some walk trips to and from nearby complementary land uses. The Proposed Project would generate 1,580 non-auto, non-transit trips in the AM peak hour and 3,083 during the weekday PM peak hour in the Maximum Residential Scenario. The Proposed Project would generate 1,816 non-auto, non-transit trips in the AM peak hour and 3,367 during the weekday PM peak hour in the Maximum Commercial Scenario. In addition, many transit trips also end or begin with a walk trip to get to or from their stop. Non-auto, non-transit trips include walk, bicycle, motorcycle, taxi, and other transportation modes.

5.4.1 Internal Pedestrian Network

The Proposed Project includes sidewalks throughout, of a minimum width of nine feet, including new internal streets and the existing streets on the Proposed Project site perimeter. The Proposed Project would also complete the portion of the proposed Blue Greenway, a planned multi-use path along the eastern waterfront of San Francisco, along its eastern frontage. The proposed sidewalk network would comply with City standards for sidewalks on residential streets per the Better Streets Plan and would accommodate the pedestrian trips generated by the Proposed Project.

All new intersections would be designed to City standards, generally as compact as possible (given design vehicle requirements for turning) for a pedestrian-friendly design. Additionally, all internal roadways would be two lane roads, some with on-street parking and some with bike lanes, which is likely to result in lower travel speeds appropriate for a more pedestrian-oriented environment. All internal roadway intersections would be all-way stop controlled intersections. The Proposed Project also includes a shared street treatment on Maryland Street, in which streets would be curbless and designed to prioritize pedestrian travel by implicitly slowing traffic speeds using pedestrian volumes, design, and other cues to slow or divert vehicle traffic.

The Proposed Project's parking structures would be dispersed throughout the site, with access points and driveways that could create conflicts with pedestrians. While these conflicts are generally expected and a necessary part of provision of off-street parking, the effect of vehicle queuing across sidewalks should be minimized with implementation of Potential Measure TR-2: Queue Abatement, to ensure that pedestrian travel is unimpeded.

> **Potential Measure TR-2 (RES/COM): Queue Abatement**
>
> As a potential measure to minimize the vehicle queues at the Proposed Project driveway into the public right-of-way, the Proposed Project should be subject to the Planning Department's vehicle queue abatement Conditions of Approval (see **Appendix F**).

Abatement methods could include improving on-site vehicle circulation or on-site queuing capacity, employing parking attendants, using "LOT FULL" signs, using parking occupancy sensors and signage directing drivers to available spaces, or time-of-day parking surcharges.

Generally, the Proposed Project's internal pedestrian network would be adequate to accommodate expected pedestrian demand and would result in a **less-than-significant** impact.

5.4.2 Project Site Pedestrian Access

Pedestrian travel to and from the Proposed Project would likely occur on Third Street north of 20th Street and south of 22nd Street. The Proposed Project's access points would use existing intersections on Illinois Street at 20th and 22nd streets, and a new intersection at Illinois Street and 21st Street. Several barriers to accessible pedestrian travel currently exist between these intersections, including missing ADA curb ramps at the intersection of 22nd Street and Illinois Street and a narrow stretch of sidewalk with obstructions mid-block on Illinois Street between 22nd Street and 20th Street. This lack of an accessible path of travel to and from the project site would be a significant impact. Additionally, the Proposed Project's transit riders would cross Illinois Street at the intersections with 20th, 21st, and 22nd streets. Although the Proposed Project is proposing to construct a new signal at the new intersection at Illinois Street and 21st Street, pedestrian crossings at the all-way stop controlled intersections along Illinois Street at 20th and 22nd streets would be particularly challenging, given forecasted increases in traffic along Illinois Street. This would be a **significant** impact.

Mitigation Measure TR-3 (RES/COM): Improve Pedestrian Facilities at Adjacent Streets to Project

As part of construction of the Proposed Project roadway network, the project sponsors shall fund the following improvements:

- Install ADA curb ramps on all corners at the intersection of 22nd Street and Illinois Street
- Signalize the intersections of Illinois Street with 20th and 22nd streets.
- Modify the sidewalk on the east side of Illinois Street between 22nd and 20th streets to a minimum of 10 feet. Relocate obstructions, such as fire hydrants and power poles, as feasible, to ensure an accessible path of travel is provided to and from the Proposed Project.

Implementation of Mitigation Measure TR-3 would reduce the Proposed Project's impact to site pedestrian access to **less than significant with mitigation**.

5.4.3 Off-Site Pedestrian Network

The Proposed Project would also contribute demand to off-site pedestrian facilities. As noted above, in addition to walk trips between the Proposed Project site and other uses, Proposed Project-generated transit trips would begin as pedestrian trips traveling to the appropriate transit stop. Residents and employees traveling to and from the nearest bus and light rail stop would typically use 20th or 22nd Street adjacent to the Proposed Project to access transit on Third Street. 22nd Street also provides the main pedestrian route for transit riders heading to and from the nearest Caltrain station on 22nd Street at I-280. The Proposed Project site is located within a 45 minute walk from both BART stations at 16th Street and 24th Street, farther than the typical walk trip, such that BART riders would most often choose to use the Project shuttle which would transport passengers between the Project and the Mission and SoMA neighborhoods.

Beyond the immediate Proposed Project frontage, no improvements to the pedestrian facilities in the area are proposed by the Proposed Project. Due to the increase in transit ridership forecasted for Caltrain, the 22nd Street corridor is likely to be heavily used by pedestrians that do not use the shuttle. A separate streetscape project is proposed along 22nd Street between Illinois Street and Pennsylvania Avenue (22nd Street Greening Master Plan) that would provide a connection from the Blue Greenway to the 22nd Street

Caltrain station. Improvements include tree planting, pedestrian lighting, replacement of sidewalk concrete in certain areas, intersection corner bulbouts, painted crosswalks, and bicycle route markings. The addition of pedestrians due to the Proposed Project is unlikely to result in substantial overcrowding on public sidewalks along 22nd Street or otherwise create potentially hazardous conditions for pedestrians. As mentioned in Section 5.4, the closest stops for the 22 Fillmore and 48 Quintara / 24th Street have sufficient sidewalk space available for waiting passengers and the T Third platform at Third Street / 20th Street had space for additional riders waiting for Muni as well.

Appropriate facilities are provided for pedestrians accessing the various transit routes, including Caltrain, the T Third, and the local Muni routes.While there are some existing gaps elsewhere in the off-site pedestrian network, which are occasionally inconvenient, the existing pedestrian environment offers an ample number of routes to get to key destinations .

The Proposed Project would provide a net improvement to the pedestrian environment in the neighborhood and there would be adequate facilities to get to key destinations, such as specialty grocery stores, transit stations, and other neighborhood-serving retail and entertainment. Therefore, the Proposed Project's impact to off-site pedestrian facilities would be **less-than-significant**.

5.5 BICYCLE IMPACTS



The Proposed Project would increase bicycle demand in the area. The first part of this section describes the bicycle parking requirements for the Proposed Project. The second part describes the bicycle circulation impacts in the area around the Proposed Project site.

5.5.1 Bicycle Parking

The City of San Francisco Planning Code Section 155.2 specifies the requirements for bicycle parking in new developments. However, as the Proposed Project is a Special Use District, it is able to create its own bicycle parking standards. **Table 25** summarizes the requirements for the land uses in the Proposed Project. Class 1 bicycle parking can include bicycle lockers, check-in facilities, monitored parking, or other types of restricted-access parking area. Class 2 bicycle parking typically refers to publicly available bicycle racks for short-term use.

The Maximum Residential Scenario would provide approximately 1,142 Class 1 and 514 Class 2 bicycle parking spaces (in compliance with San Francisco Planning Code, Section 155.1-155.4). The Maximum Commercial Scenario would provide approximately 995 Class 1 and 475 Class 2 bicycle parking spaces (again, in compliance with San Francisco Planning Code, Section 155.1-155.4). Bicycle amenities (showers and lockers) would be provided in excess of Planning Code requirements.

TABLE 25: BICYCLE PARKING CODE REQUIREMENTS	
Planning Code Land Use	Number of Bicycle Parking Spaces
District Parking (P70-G)	No minimum requirement. Parking for residential/commercial uses may be incorporated within District Parking.
Residential (P70-R)	Fewer than 50 dwelling units: 1 Class 1 space for every 2 dwelling units More than 50 dwelling units: 25 Class 1 spaces plus 1 Class 1 space for every 4 dwelling units over 50
Commercial (P70-C)	3 spaces: 10-20 ksf professional service uses or 25-50 ksf restaurants and personal service uses 6 spaces: 20-50 ksf professional service uses or 50-100 ksf restaurants and personal service uses 12 spaces: 50+ ksf professional service uses or 100+ ksf restaurants and personal service uses

Source: Pier 70 Design Guidelines, October 2015.

5.5.2 Bicycle Circulation

As discussed in Section 2.8, the area around the Proposed Project has a number of streets designated as bicycle routes. The Proposed Project site is within convenient bicycling distance of office and retail uses in the Dogpatch, Mission Bay, Mission District, Potrero Hill, South of Market, and Bayview. As such, it is anticipated that a substantial portion of the non-auto and non-transit trips generated by the Proposed Project would be bicycle trips. As noted on **Figure 6**, there are bicycle routes nearby to the Proposed Project site, including bicycle lanes on Illinois Street (Route 5), Terry A. Francois Boulevard (Route 5), Sixteenth Street (Route 40), Fourth Street (Route 40), and several blocks of Cesar Chavez Street (Route 60), and bicycle routes on Indiana Street (Route 7), a portion of Mariposa Street and Minnesota Street (Route 7), and Cesar Chavez Street (Route 60).

Bicyclists heading to or from the south would use Illinois Street, the alignment of the Bay Trail, to connect to Route 60, which provides connections to farther destinations and designated bicycle routes. Bicyclists heading to or from the north would use Terry A. Francois Boulevard or Fourth Street, both designated bicycle routes, to connect to Routes 11, 36, and 40, which provide connections to farther destinations and designated bicycle routes. Routes 40, 44 and 60 provide east-west connections that cross I-80 into the Mission District. While the existing bicycle network does not include a designated east-west route that connects to the Proposed Project between Mariposa Street and Cesar Chavez Street, bicyclists can use 20th Street, a two-lane roadway with stop-controlled intersections that travels through residential areas and small neighborhood commercial districts, to travel to and from the Potrero Hill neighborhood directly to the Proposed Project site.

The *San Francisco Bike Plan* includes several short-term improvements to the bicycle network within the Proposed Project study area that have not yet been implemented. Planned bicycle lanes on 16th Street from Third Street to Terry A. Francois Boulevard would provide an additional connection to Terry A. Francois Boulevard, a designated bicycle route and a direct access to the Proposed Project. The Proposed Project plans include the bi-directional bicycle path separated from the vehicle travel lane, which would be part of the Blue Greenway that will ultimately connect the eastern waterfront of San Francisco with the Embarcadero.

On internal roadways, bicycle facilities are proposed along 20th Street, 22nd Street and Maryland Street, and generally provide a complete bicycle network. A Class I mixed use path is proposed on 20th Street east of Louisiana Street, and a Class II (seven-foot) bicycle lane is proposed on 22nd Street west of Louisiana Street (westbound only). Class III facilities are provided on Maryland Street (both directions), 20th Street west of Georgia Street (both directions), 22nd Street west of Louisiana Street (eastbound only), and 22nd Street east of Maryland Street (both directions).

These roadways provide direct connections to and from external roadways such as Illinois Street for travel to and from the Proposed Project site. In order to provide sharrow pavement markings along 21st Street and Louisiana Street, the entire internal roadway network would have to ensure the most convenient and direct route is available to all destinations within the Proposed Project site. Though the sharrow treatment is appropriate along these roadways where speeds are 25 mph or below and there is not adequate width to provide a full bike lane, putting a bicycle facility on every street would not give cyclists the information they need to understand where they are supposed to be.

The Class I mixed use path along 20th Street, which is also a portion of the Blue Greenway, may be used by bicyclists to access the Proposed Project. Riders continuing through the area on 20th Street from the Blue Greenway would likely continue on the travel lanes. The intersection between the Blue Greenway and 20th Street (at Georgia Street) has been designed (including the all-way stop control for vehicles and bicyclists) to encourage slow vehicle speeds and allow bicyclists to transition between the mixed use path and travel lanes.

As discussed above, the Proposed Project would comply with the Planning Code requirements for bicycle parking; the Proposed Project would not increase bicycle traffic to a level that adversely affects bicycle facilities in the area; nor would the Proposed Project create a new hazard or substantial conflict to bicycling. The Proposed Project would not negatively affect bicycle accessibility to the Proposed Project site or adjoining areas. Thus, the Proposed Project's impact to bicycle facilities and circulation would be considered **less-than-significant**.

5.6 LOADING IMPACTS



This section describes the Proposed Project's freight and delivery loading impacts. The Proposed Project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site loading facilities or within convenient on-street loading zones, and created potentially hazardous conditions or significant delays affecting traffic, transit, bicycles or pedestrians. The Design for Development document includes turning radii analysis completed for WB-40, WB-50, and WB-62[25] design vehicles that shows all vehicles movements can be achieved with the proposed network. These turning radii templates are included in **Appendix H**. All public streets shall be designed to accommodate WB-40 trucks.

[25] WB-40, WB-50, and WB-62 are a 40' wheelbase intermediate semitrailer, a 50' wheelbase intermediate semitrailer, and a 62' wheelbase Interstate semitrailer truck, respectively, where the wheelbase refers to the distance between the centers of the front-most and rear-most wheels.

To minimize conflicts with pedestrians and bicyclists, a maximum of one loading access point would be permitted for each building frontage where off-street loading is planned. This requirement would minimize curb cuts and prioritize pedestrian movement where a sidewalk is present. Exterior loading docks, where loading and unloading occurs outside of a building, would not be permitted, and commercial loading entries would be required to be at least 60 feet from the corner of an intersection. Waste collection facilities would be provided separately for each building and would be visually screened from the public right-of-way, minimizing conflicts with travelways. For the residential trash/recycling pickup, trash containers would be transported by the building staff from the trash rooms to the curb at the time of trash pickup and returned following pickup, or Recology personnel would access the trash rooms to retrieve the trash containers. For the commercial/non-residential uses, trash would be carted to the curb by building management or tenants of the commercial spaces, or Recology personnel would access the trash rooms to retrieve trash containers. Building management would coordinate with the appropriate disposal and recycling company regarding the specific locations of garbage containers.

The Proposed Project includes a shared street treatment on Maryland Street that would allow limited or no vehicular access at some times, either for special events or at designated times of day. However, for all buildings fronting Maryland Street service entrances would be provided on 21st, Louisiana, and 22nd streets (although on-street loading could still occur from Maryland Street during periods when the shared street was open to vehicular access). Thus, limiting or prohibiting delivery vehicles from accessing Maryland Street from time to time would not result in a significant impact because building service access would be retained.

Despite the fact that the Proposed Project would minimize loading conflicts with bicycles and pedestrians and would not result in significant loading impacts on the shared street, there would be a loading supply shortfall that would result in significant impacts.

Overall, the Maximum Residential Scenario would generate a demand for approximately 640 daily delivery and service vehicle trips, and the Maximum Commercial Scenario would generate a demand for approximately 855 daily delivery vehicle and service vehicle trips. Deliveries would be primarily small trucks and vans, typical of deliveries throughout the City.

The residential units in the Maximum Residential Scenario would generate a demand for four loading spaces in the average loading hour and five loading spaces in the peak loading hour (generally 1 hour between the hours of 10:00 a.m. and 1:00 p.m.). The residential units in the Maximum Commercial Scenario would generate a demand for two loading spaces in both the average and peak loading hours (see **Table 19**).

The demand for loading spaces for non-residential uses would range from 26 spaces in the Maximum Residential Scenario to 38 spaces in the Maximum Commercial Scenario in the average loading hour. In the peak loading hour, the demand for non-residential uses would be for 32 loading spaces in the Maximum Residential Scenario and 48 loading spaces in the Maximum Commercial Scenario.

The Proposed Project would include on-street and/or off-street loading spaces based on square footage of gross leasable area.[26] **Table 26**: Proposed Loading Space Ratios presents the minimum loading requirements that would be applicable to new uses on the project site under both the Maximum Residential Scenario and the Maximum Commercial Scenario as described in the Proposed Project's Design for

[26] Forest City, *Pier 70 Design Guidelines,* Section 9.9 Loading and Services, p. 262-263. DRAFT October 2, 2015.

Development guidelines. Each residential building would include one or two on-street or off-street loading spaces, depending on the size of the building. Commercial/office buildings with under 50,000 square feet of gross leasable area would not be required to provide loading spaces; between 50,001 and 100,000 square feet, one on-street loading space would be required; between 100,001 and 250,000 square feet, one off-street loading space would be required; between 250,001 and 500,000 square feet, two off-street loading spaces would be required; and over 500,000 square feet, three off-street loading spaces would be required. These requirements are similar to, but not the same as, Planning Code requirements for loading.

When applied to the specific buildings proposed as part of the Proposed Project, the Proposed Project's loading supply would be 28 spaces in the Maximum Residential Scenario and 25 spaces in the Maximum Commercial Scenario. This would result in a shortfall of nine loading spaces during the peak hour of loading for the Maximum Residential Scenario and a shortfall of 25 loading spaces during the peak hour of loading for the Maximum Commercial Scenario.

TABLE 26: PROPOSED LOADING SPACE RATIOS

Use	Gross Leasable Area	Minimum	Loading Space Type
Commercial/Office	0 - 50,000 GLA	Not Required	
	50,001 – 100,000 GLA	1	On-street
	100,001 – 250,000 GLA	1	Off-street
	250,001 – 500,000 GLA	2	Off-street
	500,001 and above GLA	3	Off-street
Retail	0 – 10,000 GLA	Not Required	
	10,001 – 30,000 GLA	1	On-street
	30,001 – 50,000 GLA	2	Off-street
	50,001 GLA and above	1 per 25,000 GLA	Off-street
Residential	0 – 225,000 GLA	1	On-street or Off-Street
	225,001 GLA and above	2	On-street or Off-street
RALI (Retail/Arts/Light Industrial)	0 – 50,000 GLA	Not required	
	50,001 – 150,000 GLA	1	On-street
	150,001 – 250,000 GLA	2	Off-street

Source: Forest City, Pier 70 Design Guidelines, DRAFT October 2, 2015.

Most residential loading demand would be generated when tenants move in and out of a residential unit. This loading would be either from off-street loading facilities or on-street, likely near the building entrances, depending on the size of building and loading facilities providedby the associated building. For residential buildings with off-street facilities, new tenants would coordinate with building management to reserve space at the off-street loading facilities provided by that building. For residential buildings with no off-street facilities, new tenants would either use on-street loading facilities, if available, or they could apply for a temporary "no parking" permit with SFMTA, which prohibits on-street public parking for a temporary period to allow for moving vans and trucks to park. Residential move-ins and move-outs are typically a relatively infrequent occurrence, except when a building is first occupied, such that the off-street loading facilities and on-street curb space will likely be adequate for move-ins and move-outs. Residential buildings would generate parcel delivery vehicles (e.g., United Parcel Service and Federal Express vans) in addition to large moving vans. These parcel deliveries are usually short and would not substantially affect circulation around the project site. The one or two on-street or off-street loading spaces that would be required for each residential building would likely satisfy the residential loading demand. Therefore, extra on-street loading spaces would not be necessary in residential areas of the project site.

Non-residential deliveries of goods to businesses such as restaurants and retail tenants would occur at on-street loading spaces at least 75 feet long or in off-street loading areas as required for buildings serving commercial/office and RALI uses with more than 100,000 gross leasable square feet. Given the forecast loading space shortfalls for both the Maximum Residential Scenario and the Maximum Commercial Scenario, service and delivery vehicles may occasionally park in regular public parking spaces or double-park and partially block local streets while loading and unloading goods. Although this is a relatively common occurrence in San Francisco and a small shortfall would not be unusual, the scale of the Proposed Project's loading shortfall combined with its relatively narrow streets would constitute a significant impact.

Other than increasing the off-street loading space requirements in the Design for Development documentation to better match demand, it may be beyond the project sponsors' control to fully mitigate the significant impact. However, there are measures the project sponsors could take to reduce the severity of the impact. Those measures are outlined in Mitigation Measure TR-4A and Mitigaiton Measure TR-4B, below.

Mitigation Measure TR-4A: Coordinate Deliveries

The Project's Transportation Coordinator shall coordinate with building tenants and delivery services to minimize deliveries during AM and PM peak periods.

Although many deliveries cannot be limited to specific hours, the Transportation Coordinator should work with tenants to find opportunities to consolidate deliveries and reduce the need for peak period deliveries, where possible.

Mitigation Measure TR-4B: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed.

After completion of the first phase of the Proposed Project, and prior to approval of each subsequent phase, the project sponsors shall conduct a study of utilization of on- and off-street commercial loading spaces. The methodology for the study shall be reviewed and approved by the Planning Department prior to completion. If the result of the study indicates that fewer than 15 percent of the commercial loading spaces are available during the peak loading period, the

project sponsors shall incorporate measures to convert existing or proposed general purpose on-street parking spaces to commercial parking spaces in addition to the required off-street spaces.

Implementation of Mitigation Measures TR-4A and TR-4B may not fully resolve the loading shortfall, as the project's Transportation Coordinator may not be able to shift on-site delivery times. Additionally, there may not be an adequate supply of on-street general purpose parking spaces to convert to commercial loading spaces such that the loading shortfall can be accommodated on-street. Thus, even with implementation of Mitigation Measures TR-4A and TR-4B, the Proposed Project's loading impacts would remain **significant and unavoidable**.

5.7 EMERGENCY ACCESS IMPACTS



Emergency access to the Proposed Project site would remain unchanged compared to Existing Conditions. Emergency vehicles would continue to access the site from Third Street, Illinois Street, 20th Street and 22nd Street. Additionally, the Proposed Project would include a new connection to the site from Illinois Street at 21st Street. Aside from the general increase in vehicle traffic that would result from the additional activity at the site, the Proposed Project would not inhibit emergency access to the Proposed Project site.

Internal to the Proposed Project site, most roadways have at least 22 feet curb-to-curb for emergency vehicles (including bicycle lanes but not including parking bays). The Design for Development document (*Pier 70 Design Guidelines*, October 2015) includes turning radii analysis completed for WB-40, WB-50, and WB-62 design vehicles that shows all large vehicle movements can be achieved with the proposed network. These templates were reviewed, and additional turning radii templates were completed as part of this analysis. These turning radii templates are included in Appendix H. The turning radii templates indicate that trucks can make the necessary movements throughout the site.

The Project Sponsor and the San Francisco Fire Department are still negotiating the requirements of the internal roadway network. Between 20th Street and 21st Street, Louisiana Street has a single 15-foot southbound travel lane and one 12-foot wide loading bay, which would provide sufficient travel width for emergency vehicles.

Although not required to address significant impacts, implementation of Potential Measure TR-5: Strategies to Enhance Transportation Conditions During Events would ensure that events at Pier 70 are coordinated with events at AT&T Park to further reduce the less-than-significant effects of congestion on emergency vehicle circulation.

Potential Measure TR-5: Strategies to Enhance Transportation Conditions During Events.

The project's Transportation Coordinator should participate as a member of the Mission Bay Ballpark Transportation Coordination Committee (MBBTCC) and provide at least 1-month notification prior to the start of any event that would overlap with an event at AT&T Park. The City and the project sponsors should meet to discuss transportation and scheduling logistics for occasions with multiple events in the area.

The Project applicant has been designing their internal circulation plan with the Planning Department and the Fire Department. With clearance from the Fire Department (which must be obtained prior to construction), the Proposed Project would have a **less-than-significant** impact to emergency access.



5.8 CONSTRUCTION IMPACTS

The discussion of construction impacts is based on currently available information from the project sponsor and professional knowledge of typical construction practices in San Francisco. Prior to construction, as part of the construction application phase, the project sponsor and construction contractor(s) would be required to meet with Public Works and SFMTA staff to develop and review truck routing plans for demolition, disposal of excavated materials, materials delivery and storage, as well as staging for construction vehicles. The construction contractor would be required to meet the City of San Francisco's Regulations for Working in San Francisco Streets, (the Blue Book), including those regarding sidewalk and lane closures, and would meet with SFMTA staff to determine if any special traffic permits would be required. In addition to the regulations in the Blue Book, the contractor would be responsible for complying with all city, state and federal codes, rules and regulations.

Buildout of the Proposed Project is anticipated to occur in five phases over an approximately 11-year period, from 2018 through 2029. Project construction and rehabilitation phasing is presented in **Table 27** and **Table 28**. **Figures 10A** and **10B** depict the construction phasing plan. Infrastructure would be constructed in tandem with new and rehabilitated buildings and open space. Construction impacts would be the same for both the Maximum Residential Scenario and the Maximum Commercial Scenario.

TABLE 27: PROJECT CONSTRUCTION AND REHABILITATION PHASING FOR THE MAXIMUM RESIDENTIAL SCENARIO

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (GSF/No. of Residential Units)	Commercial (GSF)	RALI (GSF)		
Phase 1 (2018-2019)	28-Acre Site						
	Illinois Parcels	PKN	261,700 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new)
Phase 2 (2018-2020)	28-Acre Site	Building 2*, Parcel C1, Parcel C2, Parcel D, Parcel E2	578,250 / 662 units	221,100	52,035	Building 12 Market Plaza Market Square Slipway Commons (western portion)	20th Street (new/central portion) 21st Street (new/eastern portion) 22nd Street (existing and new) Louisiana Street (new/southern portion) Maryland Street (new/northern portion)
		Building 12*		60,000	105,500		
	Illinois Parcels						
Phase 3 (2021-2023)	28-Acre Site	Parcel A, Parcel F, Parcel G	436,100 / 505 units	288,200	57,270	Irish Hill Playground	Maryland Street (new/southern portion [continued from Phase 2])
	Illinois Parcels	PKS	213,100 / 240 units		11,000		
Phase 4 (2024-2026)	28-Acre Site	Parcel E1, Parcel E3, Parcel E4, Parcel B1, Parcel B2	378,600 / 436 units	526,350	189,675	Slipway Commons (eastern portion [continued from Phase 3]) Waterfront Terrace Waterfront Promenade (northern portion)	20th Street (western and eastern portions [continued from Phase 2]) 21st Street (eastern portion [continued from Phase 2]) 22nd Street (eastern portion [continued from Phase 2])
		Building 21*			10,200		
	Illinois Parcels	Parcel HDY1, Parcel HDY2	285,200 / 335 units		17,200		

TABLE 27: PROJECT CONSTRUCTION AND REHABILITATION PHASING FOR THE MAXIMUM RESIDENTIAL SCENARIO

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (GSF/No. of Residential Units)	Commercial (GSF)	RALI (GSF)		
Phase 5 (2027-2029)	28-Acre Site	Parcel H1, Parcel H2	477,050 / 547 units		40,700	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
TOTAL			2,630,000 / 3,025 units	1,102,250	479,980		

Notes: * = denotes an existing building that would be rehabilitated under the Proposed Project.

TABLE 28: PROJECT CONSTRUCTION AND REHABILITATION PHASING FOR THE MAXIMUM COMMERCIAL SCENARIO

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (GSF/No. of Residential Units)	Commercial (GSF)	RALI (GSF)		
Phase 1 (2018-2019)	28-Acre Site						
	Illinois Parcels	PKN	260,500 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new) 20th Street Pump Station (new)
Phase 2 (2018-2020)	28-Acre Site	Parcel A, Parcel D, Parcel E2, Building 2*	389,400 / 445 units	348,200	97,400	Building 12 Market Plaza Market Square Slipway Commons (western portion)	20th Street (new/central portion) 22nd Street (existing and new) Maryland Street (new/northern portions)
		Building 12*			52,720		
	Illinois Parcels	PKS	215,500 / 245 units		11,000		
Phase 3 (2021-2023)	28-Acre Site	Parcel C2, Parcel E1, Parcel F, Parcel G	325,350 / 375 units	442,200	57,620	Irish Hill Playground	21st Street (new/eastern portion) Louisiana Street (new) Maryland Street (new/southern portion [continued from Phase 2])
	Illinois Parcels	Parcel HDY1, Parcel HDY2		231,700	28,135		
Phase 4 (2024-2026)	28-Acre Site	Parcel B1, Parcel B2, Parcel C1, Parcel E3,	242,250 / 280 units	747,450	85,505	Slipway Commons (eastern portion [continued from Phase 2]) Waterfront Terrace Waterfront Promenade (northern portion)	20th Street (western and eastern portions [continued from Phase 2]) 21st Street (western portion [continued from Phase 3]) 22nd Street (eastern portion [continued from Phase 2])
		Building 21*, Parcel E4			110,400		
	Illinois Parcels						

TABLE 28: PROJECT CONSTRUCTION AND REHABILITATION PHASING FOR THE MAXIMUM COMMERCIAL SCENARIO

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (GSF/No. of Residential Units)	Commercial (GSF)	RALI (GSF)		
Phase 5 (2027-2029)	28-Acre Site	Parcel H1, Parcel H2		486,200	37,570	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
Total			1,433,000 / 1,645 units	2,262,350	486,950		

Notes: * = denotes an existing building that would be rehabilitated under the Proposed Project.

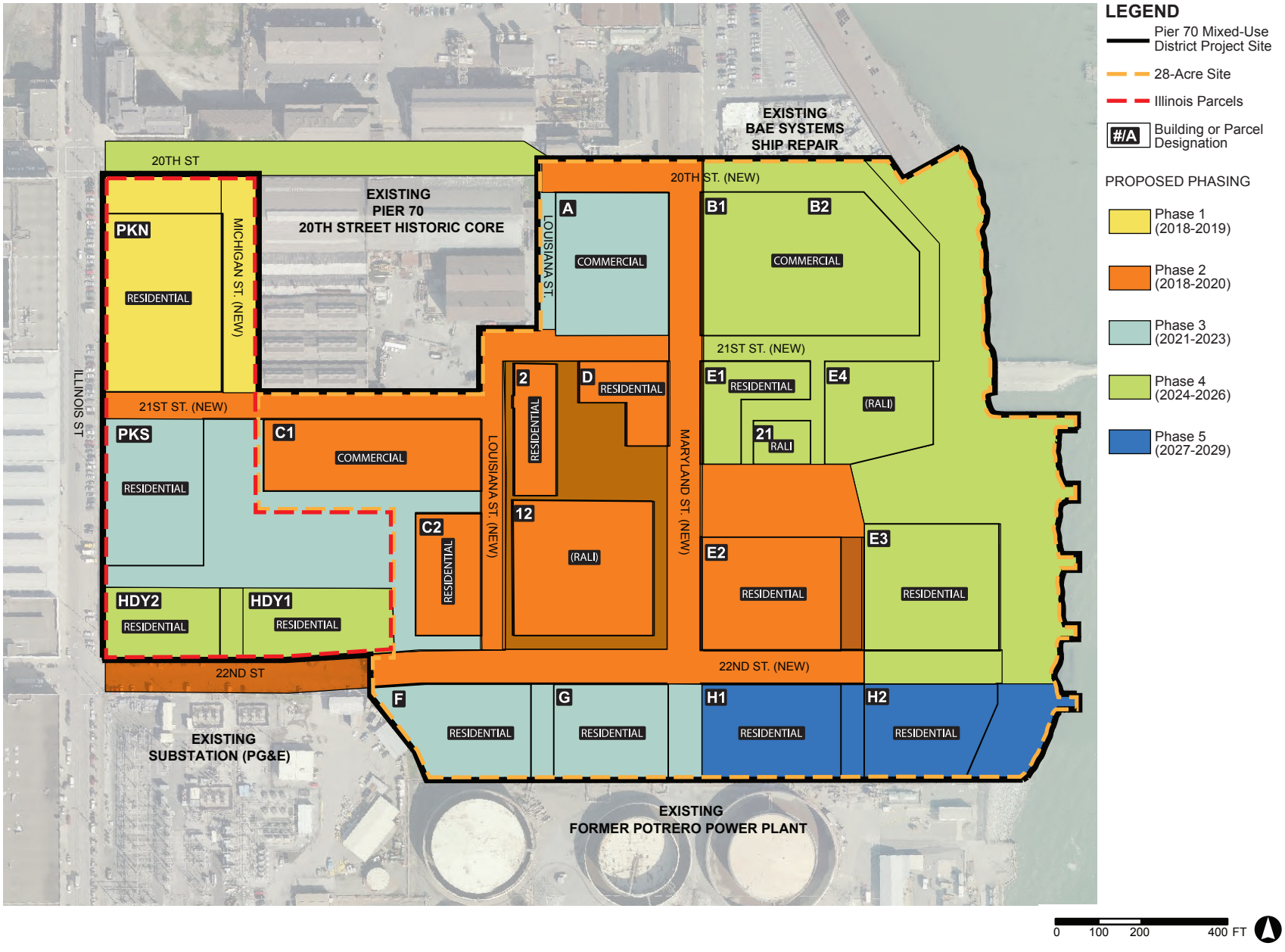


Figure 10A

Proposed Phasing Plan - Maximum Residential Scenario

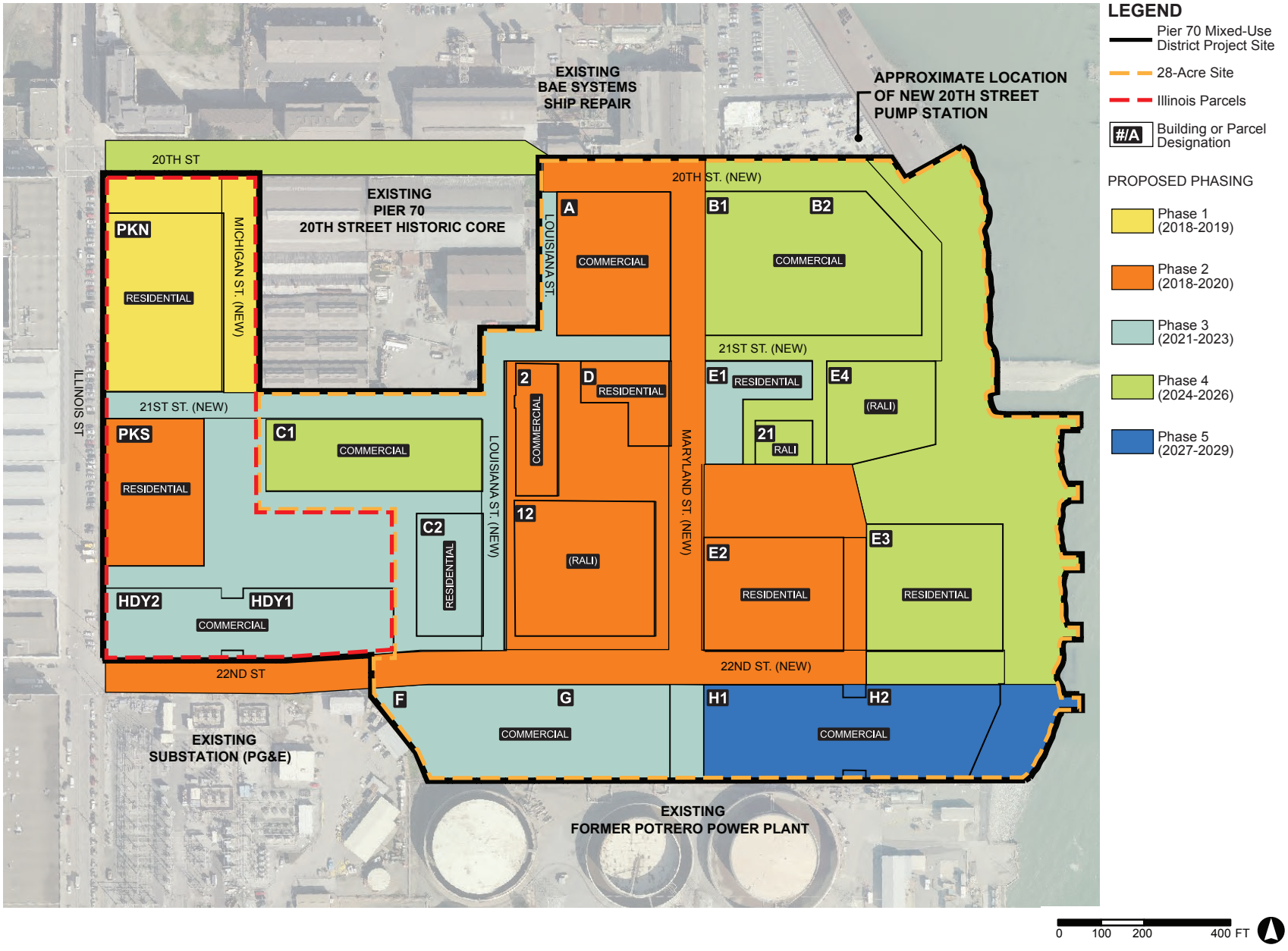


Figure 10B

Proposed Phasing Plan - Maximum Commercial Scenario

Construction related activities would generally occur Monday through Saturday, between 7:00 AM and 8:00 PM, and the typical work shift for most construction workers would be from 7:00 AM to about 3:30 PM. Occasionally, work may be required to start before 7AM or extend beyond 8 PM. Construction is not anticipated to occur on Sundays or major legal holidays, but may occur on an as-needed basis. The hours of construction would be stipulated by the Department of Building Inspection, and the contractor would be required to comply with the San Francisco Noise Ordinance and the Blue Book, including requirements to avoid peak hour construction activities on adjacent streets.

Construction staging would occur on-site and may also occur on the sidewalks adjacent to the project site on Illinois Street and on 20th Street; there are no sidewalks on 22nd Street. Where sidewalks are closed, protected pedestrian walkways should be provided in the adjacent parking lanes.

Construction activities may also require temporary travel lane closures, which would be coordinated with the City in order to minimize the impacts on local traffic and transit. Construction activities, such as delivery of large construction equipment and oversized construction materials that would require one or more temporary lane closures on adjacent streets would need to be conducted on weekend days when pedestrian, transit and traffic activity is lower. Prior to construction, the project contractor would coordinate with Muni's Street Operations and Special Events Office to coordinate construction activities and reduce any impacts to transit operations on Illinois Street. The temporary sidewalk and travel lane closures would be required to coordinate with the City in order to minimize the impacts on traffic. In general, lane and sidewalk closures are subject to review and approval by the SFMTA's Transportation Advisory Staff Committee (TASC) for permanent travel lane and sidewalk closures, and the Interdepartmental Staff Committee on Traffic and Transportation (ISCOTT) for temporary sidewalk and travel lane closures. Both TASC and ISCOTT are interdepartmental committees that include representatives from the Public Works, SFMTA, Police Department, Fire Department, and the Planning Department.

There are no bus stops located adjacent to the project site on Illinois, 20th or 22nd streets, and therefore relocation of bus stops would not be required. In addition, the 48 Quintara/24th Street (on Illinois Street) is a motor coach line, and there are no support poles or overhead wires on either Illinois Street.

The Proposed Project site is located adjacent to the rapidly-changing Mission Bay neighborhood. Major new construction is expected over the next decade and as a result, construction of the Proposed Project may be concurrent with construction throughout Mission Bay. Though the area is largely industrial, and some roads can easily handle large trucks and deliveries of construction materials, many of the new and planned streets as part of the Mission Bay plan are not as wide. A detailed truck circulation plan should be developed before construction begins and truck access routes would be reviewed with the SFMTA as part of the permit process prior to construction. Specifically, trucks traveling from the Proposed Project site and the freeways should use Cesar Chavez Street, Third Street, and 20th Street to access the Proposed Project site. Trucks coming from the west within San Francisco should use 16th Street or Cesar Chavez Street to access Third Street and then 20th Street to the Proposed Project site.

During the construction period, there would be a flow of construction-related trucks into and out of the site. There would be an average of between 15 and 85 construction trucks traveling to the site on a daily basis during the demolition, site preparation and grading/excavation construction phases. The greatest number of construction truck trips would occur during the grading and excavation phase, with an average of 85 and a maximum of 250 truck trips per day. The impact of construction truck traffic would be a temporary lessening of the capacities of streets due to the slower movement and larger turning radii of trucks, which may block travel lanes, and affect both traffic and Muni operations. The exact routes that construction trucks would use would depend on the location of construction materials being transported to the project site and the location of the construction activities on the project site as

well as the location of disposal sites for excavated soil and demolition debris. However, it is reasonable to assume that construction vehicles would typically use Third Street and 25th Street or Mariposa Street to access I-280 to travel south; Third Street and either Second or Fifth Streets to reach the Bay Bridge and the East Bay; and Third Street, Howard Street and Van Ness Avenue (U.S. 101) to travel to North Bay destinations. All of these streets have two or more travel lanes in each direction and are designed to handle truck traffic. The impact of construction traffic on these streets could be a slight lessening of their capacities due to slower-moving vehicles and would not substantially affect peak period conditions because construction work schedules do not typically coincide with the peak commute periods. Truck access routes would be reviewed with the SFMTA as part of the traffic control plans.

There would be an average of between 20 and 40 construction works per day at the project site during the demolition, site preparation, grading/excavation and drainage/utilities/sub-grade phases of construction. The average number of construction workers per day at the project site would increase to between 125 and 150 during the building construction and architectural coating phases of construction. The trip distribution and mode split of construction workers are not known. However, it is anticipated that the addition of the worker-related vehicle- or transit-trips would not substantially affect transportation conditions, as impacts on local intersections or the transit network would be substantially less than those associated with the Proposed Project and temporary in nature. Construction workers who drive to the site would cause a temporary parking demand along the building frontage. Construction workers would need to park either on-street or in parking facilities that currently have availability during the day. However, parking shortfalls would be temporary and are not considered a significant environmental impact.

The project sponsor and construction contractor(s) would be required to prepare traffic control plans for the various construction phases, which would be intended to reduce potential conflicts between construction activities and pedestrians and vehicles at the project site and with other construction projects in the project vicinity that are expected to occur during the 11-year construction period.

Therefore, the Proposed Project's construction impacts were determined to be **less-than-significant**. Although no construction impacts were identified, the following Potential Measure has been identified:

Potential Measure TR-6 (RES/COM): Construction Management

Traffic Control Plan for Construction – In order to reduce potential conflicts between construction activities and pedestrians, bicyclists, transit, and autos during construction activities, the Project applicant shall require construction contractor(s) to prepare a traffic control plan for major phases of Proposed Project construction (e.g. demolition, construction, or renovation of individual buildings). The Project applicant and their construction contractor(s) will meet with relevant City agencies to coordinate feasible measures to reduce traffic congestion, including temporary transit stop relocations and other measures to reduce potential traffic and transit disruption and pedestrian circulation effects during major phases of construction. For any work within the public right-of-way, the contractor would be required to comply with the City of San Francisco's Regulations for Working in San Francisco Streets, which establish rules and permit requirements so that construction activities can be done safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicular traffic. Additionally, non-construction-related truck movements and deliveries shall be limited to the maximum feasible extent during peak hours (generally 7 to 9 AM and 4 to 6 PM, or other times, as determined by SFMTA and its Transportation Advisory Staff Committee [TASC]).

In the event that the construction timeframes of the major phases and other development projects adjacent to the Proposed Project site overlap, the Project applicant should coordinate with City Agencies through

the TASC and the adjacent developers to minimize the severity of any disruption to adjacent land uses and transportation facilities from overlapping construction transportation impacts. The Project applicant, in conjunction with the adjacent developer(s), shall propose a construction traffic control plan that includes measures to reduce potential construction traffic conflicts, such as coordinated material drop offs, collective worker parking and transit to job site and other measures.

Reduce SOV Mode Share for Construction Workers – In order to minimize parking demand and vehicle trips associated with construction workers, the Project applicant shall require the construction contractor to include in the Traffic Control Plan for Construction methods to encourage walking, bicycling, carpooling, and transit access to the campus sites by construction workers in the coordinated plan.

Project Construction Updates for Adjacent Residents and Businesses – In order to minimize construction impacts on access for nearby residences, institutions, and businesses, the Project applicant shall provide nearby residences and adjacent businesses with regularly-updated information regarding Proposed Project construction, including construction activities, peak construction vehicle activities (e.g., concrete pours), travel lane closures, and lane closures via a newsletter and/or website.

6 CUMULATIVE IMPACT ANALYSIS

As noted earlier, the Proposed Project's impacts were evaluated for 2020 Baseline Plus Project conditions and for longer-term 2040 Cumulative conditions. This chapter discusses the Proposed Project's contribution to cumulative transportation-related impacts. The geographic context for the analysis of cumulative transportation impacts includes the sidewalks and roadways adjacent to the Proposed Project site, and the local roadway and transit network in the vicinity of the Proposed Project site. The discussion of cumulative transportation impacts assesses the degree to which the Proposed Project would affect the transportation network in conjunction with other reasonably foreseeable projects.

Reasonably foreseeable development projects and transportation network changes were considered in the Cumulative analysis. Projects in the study area include (but are not limited to) the following:

- Mission Bay Redevelopment Plan
- Candlestick Point-Hunters Point Shipyard Development Plan
- California Pacific Medical Center Long Range Development Plan
- Development associated with neighborhoods plans including the Eastern Neighborhoods Plan, Western SoMa Plan, Market-Octavia Plan, and Rincon Hill Plan
- Muni Forward (formerly TEP)
- San Francisco Bicycle Plan
- Geary Bus Rapid Transit (BRT) Project
- Van Ness BRT Project
- Caltrain Electrification Program
- Central SoMa Plan
- Second Street Improvement Project
- Transit Center District Plan
- India Basin Redevelopment Project

With respect to the Mission Bay Redevelopment Plan, the maximum development program for the 303-acre area includes 6,000 housing units, 4.4 million square feet of office/life science/biotechnology space, a new UCSF research campus and hospital complex, 500 ksf of neighborhood-serving retail space, a 500-room hotel, and new public amenities, such as 41 acres of public open space, a 500-student public school, a new public library, and new fire and police stations. Currently, approximately 4,100 housing units have been constructed, as well as more than 1.7 million square feet of office/life science/biotechnology space, the majority of the UCSF campus expansion, the Mission Bay Branch Library, and 15 acres of parks and open space. The Plan also included new public infrastructure, including more than 1,000 linear feet of new roads and traffic signals throughout the Plan area. The Cumulative scenario assumes complete land use buildout of the Mission Bay Redevelopment Plan.

Projects closer to Proposed Project include the following:

- Eastern Neighborhoods Plan: The Eastern Neighborhoods Plan included changes in zoning controls and General Plan amendments for an approximately 2,200-acre area on the eastern side of the City. It is intended to encourage new housing while maintaining or creating cohesive neighborhoods.
- Mission Rock Mixed-Use Project: The possible future project would be located approximately three-fourths of a mile north of the Project site in the current Giants Lot A, just south of Mission Creek. The Mission Rock development would include a mixed-use, multi-phase waterfront development with up 3.7 million square feet of residential, commercial, and retail uses, as well as a public parking garage.
- Golden State Warriors Project at Mission Bay Blocks 29-32: The project would build an 18,000-seat arena that would host the National Basketball Association's Golden State Warriors, as well as office, retail, and restaurant uses. The Project is bounded by South Street, Third Street, 16th Street, and Terry A. Francois Boulevard. The project was approved by the City of San Francisco Planning Commission in November of 2015.
- Crane Cove Park: Just to the north of the Proposed Project, Crane Cove Park is a nine-acre site bounded by Mariposa Street on the north, Illinois Street on the west, a future 19th Street extension on the south, and the San Francisco Bay on the east. The site would include open space connecting to the shoreline, as well as associated facilities and recreation retail.

6.1 TRAFFIC IMPACTS

6.1.1 Vehicle-Miles Traveled (VMT) Estimates

As mentioned, the Proposed Project's impacts were evaluated for longer-term 2040 Cumulative conditions. Because the transportation network and presumed land uses are different in 2040 Cumulative conditions from in the Baseline conditions, it is likely that the VMT per capita and per employee for each TAZ will change.

An SF-CHAMP model run for the 2040 Cumulative conditions was conducted to estimate VMT by private automobiles and taxis for different land use types. Under Cumulative conditions, for residential development, the regional average daily household VMT per capita is 16.1. For office and retail development, regional average daily work-related VMT per employee is 17.1 and 14.6, respectively. **Table 30** shows these values, as well as the values for the region minus 15 percent and the transportation analysis zone in which the Proposed Project site is located, TAZ 559.

TABLE 30: DAILY VEHICLE-MILES TRAVELED

	Regional VMT Average Per Capita	Regional Average Minus 15%	TAZ 559 (Project)
Households (Residential)	16.1	13.7	6.4
Employment (Office)	17.1	14.5	10.1
Visitors (Retail)	14.6	12.4	11.9

Source: SF-CHAMP 2015, Fehr & Peers 2015, San Francisco Planning Department 2016.

As mentioned above, anticipated Cumulative average daily household VMT per capita is 6.4 for the transportation analysis zone the Proposed Project site is located in, TAZ 559. This is 60 percent below the anticipated Cumulative

regional average daily household VMT per capita of 16.1. Given that the Proposed Project site is located in an area where anticipated Cumulative VMT is more than 15 percent below the anticipated Cumulative regional average, the Proposed Project's residential uses would not result in substantial additional VMT and impacts on Cumulative conditions would be **less-than-significant**.

Anticipated Cumulative average daily work-related VMT per employee for office uses is 11.9 for the transportation analysis zone for the Proposed Project site. This is 18 percent below the anticipated Cumulative regional average daily work-related office VMT per employee of 14.6. Given that the Proposed Project site is located in an area where anticipated Cumulative VMT is more than 15 percent below the anticipated Cumulative regional average, the Proposed Project's office and PDR uses would not result in substantial additional VMT and impacts on Cumulative conditions would be **less-than-significant**.

Finally, anticipated Cumulative average daily work-related retail VMT per employee is 10.1 for the transportation analysis zone for the Proposed Project site. This is 41 percent below the anticipated Cumulative regional average daily work-related VMT per employee of 17.1. Given that the Proposed Project site is located in an area where anticipated Cumulative VMT is more than 15 percent below the anticipated Cumulative regional average, the Proposed Project's retail, restaurant, and open space uses would not result in substantial additional VMT and impacts on Cumulative conditions would be **less-than-significant**.

6.1.2 Induced Travel and Other Traffic Hazard Issues

As mentioned earlier in Chapter 5, the Proposed Project is not a transportation project. However, the Proposed Project would include transportation features that would alter the transportation network. These features would be sidewalk widening, on-street loading zones, curb cuts, and on-street safety strategies and intersection signalization. These features fit within the general types of projects identified that would not substantially induce automobile travel. Therefore, impacts would be less-than-significant.

Additionally, the Proposed Project would add vehicle trips to the surrounding roadways; however, a general increase in traffic would not be considered a traffic hazard. Vehicle queues at the Proposed Project driveways into the public right-of-way would be subject to the Planning Department's vehicle queue abatement Conditions of Approval, as described in Potential Measure TR-3 (see also **Appendix F**). The Proposed Project's new internal street system is currently under development; however, the final designs will be subject to approval by the SFMTA, San Francisco Fire Department, and the Department of Public Works to ensure that the streets are designed consistent with City policies and design standards.

When events are planned at the Pier 70 site, the Project Sponsor should implement strategies to enhance transportation conditions in Mission Bay and nearby neighborhoods.[28] The Project Sponsor should participate as a

[28] All new parks constructed as part of the Proposed Project will be owned by the Port of San Francisco and events will be required to go through the Port's permitting process on a case-by-case basis. For private parcels within the Proposed Project, no event venues are proposed. Generally, events with fewer than 2,000 attendees will be managed via the strategies included in the Proposed Project's TDM plan and likely operated in a manner similar to the way events on Pier 70 are currently managed. However, events with more than 2,000 attendees may require additional strategies to improve transportation conditions that would be developed through the MBBTCC.

member of the Mission Bay Ballpark Transportation Coordination Committee (MBBTCC) and provide notification prior to the start of any event that would overlap with an event at the Warriors arena.

6.1.2.1 Game Day Operations

As noted earlier, the Golden State Warriors Project at Mission Bay Blocks 29-32 would build an 18,000-seat arena that would host the National Basketball Association's Golden State Warriors, as well as office, retail, and restaurant uses. The project is located approximately one-half mile north of the Proposed Project. The project EIR was certified by the Commission on Community Investment and Infrastructure (CCII) in November 2015 and the project was subsequently approved by the City of San Francisco Planning Commission in November 2015. An appeal to the EIR and project approval was denied by the Board of Supervisors in December 2015. During basketball games and large concert events, up to 17 parking control officers (PCOs) would be stationed in the project vicinity to manage vehicular, transit, bicycle, and pedestrian flows. PCOs would be stationed at intersections and light rail platforms, as well as roving through adjacent neighborhoods to monitor general parking issues during events. Temporary lane closures would be implemented after events in certain areas to allow for exiting traffic to leave the arena.

Game day operations at the Warriors arena will affect traffic conditions within the Proposed Project study area, but the Proposed Project will not affect traffic conditions on game days. Below is a summary of the game day operations:

6.1.2.1.1 Pre Event Controls

21 PCOs shall be stationed at key locations before events, where their primary task will be to manage pedestrian and vehicle traffic. These locations include:

- Third Street and South Street
- South Street and Bridgeview Way
- South Street and Terry François Boulevard
- Third Street and 16th Street
- 16th Street and Illinois Street
- 16th Street and Terry François Boulevard
- Mariposa Street and I-280 northbound ramps/Owens Street
- Mariposa Street and Third Street
- Mariposa Street and Fourth Street
- Mariposa Street and Illinois Street
- Channel Street and Third Street
- Channel Street and Fourth Street
- Mission Bay Boulevard North and Terry Francois Boulevard
- Mission Bay Boulevard South and Third Street
- King Street and Fourth Street
- Fifth Street, Harrison Street, and the I-80 westbound off-ramp
- Fifth Street, Bryant Street, and the I-80 eastbound on-ramp
- Seventh Street and Mission Bay Drive
- Seventh Street, Mississippi Street, and 16th Street
- UCSF Mission Bay Muni platform
- Event Center Garage Driveway on 16th Street

The PCO locations listed in this document are solely representative and remain flexible to respond to changing traffic conditions once the Event Center Development is complete. The number and location of will be determined in consultation with the SFMTA and refined based on monitoring during the first four years of operations.

6.1.2.1.2 Post-Event Controls

PCOs locations may include those identified previously for the pre-event scenario, with two exceptions. At least one PCO will be located at the intersection of 16th Street/Owens Street to facilitate heavy left turn flows from westbound 16th Street onto southbound Owens Street and access to I-280. One PCO will also be located at the intersection of Fifth Street/Bryant Street/I-80 eastbound ramps.

Temporary Lane Closures

Up to 17 PCOs will be stationed at key locations to redirect traffic due to the temporary lane closures. The PCOs will direct all traffic exiting the 450 South Street (office and retail employees) and Event Center (event attendees) garages to Terry François Boulevard via eastbound South Street, and restrict northbound traffic from using Bridgeview Way, except for neighborhood traffic. These PCOs will also direct any southbound traffic on Bridgeview Way left onto eastbound South Street.

PCOs will also be stationed at the Terry François Boulevard / South Street intersection to manage traffic exiting the garages on South Street. They will direct traffic either north or south on Terry François Boulevard, and restrict vehicle access onto westbound South Street. They will also manage alternating flows of pedestrian crossings of South Street and vehicles turning onto Terry François Boulevard. PCOs will also allow for local traffic to access garages on 16th Street and Illinois Street.

PCOs will be stationed on 3rd Street at Mariposa Street to direct no-event northbound traffic to alternate routes in advance of the temporary closure on northbound 3rd Street to reduce congestion at the intersection of 3rd Street / 16th Street. Northbound traffic will be redirected east along Mariposa Street to northbound Terry François Boulevard. Variable message signs (VMSs) will also direct traffic to Terry François Boulevard in advance of the intersection of 3rd Street / Mariposa Street.

Temporary Turn Restrictions

Temporary turn restrictions will be in place post-event to discourage vehicles traveling westbound on 16th Street from turning left onto 3rd Street, Owens Street or Mississippi Street. PCOs will be responsible for coning off left turn pockets at these three intersections and enforcing left-turn restrictions. Signage will be provided inside event garages to direct vehicles destined for I-280 to use Terry François Boulevard to Mariposa Street as the primary access.

Potential Measure TR-7 (RES/COM): Strategies to Enhance Transportation Conditions During Events

The Project Sponsor should participate as a member of the MBBTCC and provide at least one month notification prior to the start of any event that would overlap with an event at the Warriors arena. The City and the Project Sponsor should meet to discuss transportation and scheduling logistics for occasions with multiple events in the area. Less-than-significant transportation impacts caused by events would be further reduced by this potential measure.

6.2 TRANSIT IMPACTS

Future year 2040 Cumulative ridership projections were developed based on transit growth projections developed for the Transit Effectiveness Project and provided by the Planning Department. Forecasted future hourly ridership demand was then compared to expected hourly capacity, as determined by the likely route and headway changes identified in the Muni Forward to estimate capacity utilization under 2040 Cumulative conditions. The year 2040 Cumulative analysis assumes changes to the capacity of the lines as identified by route changes and headway changes indicated within the recommended Muni Forward (as described in Section 3.3.1.1).

6.2.1 San Francisco Muni

Regarding the Proposed Project-specific lines, the 48 Quintara-24th Street would operate all day from 48th Avenue to Hunters Point. At 25th Street and Connecticut Street, this route would no longer follow the existing alignment and would change to follow the existing 19 Polk route to Hunters Point via Evans Avenue and Innes Avenue. This would provide a new connection from the Mission District, Noe Valley and the Sunset to Third Street and Hunters Point. This route would also be re-named the 58 24th Street. For consistency, this report maintains the 48 naming convention, but the analysis reflects the planned 58 route. The 58 24th Street would be the least frequent Muni route serving Pier 70, but is still proposed for weekday headways of 15 minutes during the peak periods and midday period.

The transit person-trips forecasted to be generated by the Proposed Project were compared to the Cumulative Conditions projections on an individual route basis. **Tables 31** and **32** summarize Cumulative 2040 transit conditions for the screenlines for the AM and PM peak hours, respectively. A cumulatively significant impact would occur if reasonably foreseeable development (i.e., the cumulative conditions) would cause any of the individual routes or Downtown Screenlines to exceed their capacity utilization thresholds, or would increase ridership by more than five percent if individual routes or Downtown Screenlines are exceeding their capacity utilization thresholds under Baseline conditions. The Proposed Project would be considered to have a considerable contribution to a significant cumulative impact if it would contribute more than five percent of the forecasted cumulative growth in ridership to any of the individual routes serving the project site or the Downtown Screenlines that are expected to experience a significant cumulative impact.

Screenlines

The Northeast and Southeast Muni Downtown screenlines would operate below the 85 percent capacity utilization threshold under future 2040 Cumulative conditions in both the a.m. and p.m. peak hours. The Northwest Downtown screenline would operate below the 85 percent capacity utilization threshold under future 2040 Cumulative conditions in the a.m. peak hour. The Southwest Downtown screenline would operate below the 85 percent capacity utilization threshold under future 2040 Cumulative conditions in the p.m. peak hour. Cumulative impacts to these screenlines would be **less-than-significant**.

The Southwest Downtown screenline would operate above the 85 percent threshold in the a.m. peak hour both with and without the Proposed Project in year 2040. However, even with the Proposed Project (under either the Maximum Residential or Maximum Commercial scenario), the capacity utilization would be lower than the Baseline Condition, and therefore, considered a **less-than-significant** cumulative impact.

The Northwest Downtown screenline would operate above the 85 percent threshold in the p.m. peak hour without the Proposed Project, resulting in a **significant cumulative impact**. Because the Proposed Project is estimated to

contribute no riders to this screenline, the Proposed Project's contribution to this significant impact would **not be considerable**. No mitigation is required.

Individual Routes

In combination with reasonably foreseeable development expected to occur under Cumulative Conditions, the Proposed Project would cause the 48 Quintara/24th Street to exceed the 85 percent utilization threshold in both the Maximum Residential Scenario and the Maximum Commercial Scenario in both the AM and PM peak hours. The Proposed Project would contribute 70 to 83 percent of the growth in ridership on this Muni route in the AM peak hour and 59 to 73 percent of the growth in ridership in the PM peak hour. This would be a **considerable** contribution to a significant cumulative impact**.**

Mitigation Measure TR-1, to increase capacity on the 48 Quintara/24th Street bus route, could reduce the Proposed Project's contribution to this significant cumulative impact. However, even with implementation of Mitigation Measure TR-1, the Proposed Project's contribution could remain considerable under the Maximum Residential Scenario. Therefore, additional mitigation would be necessary to reduce the considerable contribution to the significant cumulative impact on Muni service on this route under the Maximum Residential Scenario.

> **Mitigation Measure TR-8A (RES): Increase Bus Service Capacity on the 48 Quintara/24th Street for SFMTA (Cumulative)**
>
> If Mitigation Measure TR-1 is implemented, and the option of increasing the number of buses operating on the route is selected as the preferred approach, the project sponsor shall purchase one additional vehicle (in addition to the four prescribed under Mitigation Measure TR-1), for a total of five, to reduce the Proposed Project's contribution to the significant cumulative impact to not considerable.
>
> Because the City cannot guarantee that these additional buses would be allocated to this specific route, the City cannot guarantee that supply would increase to meet the projected demand even with mitigation, and the impact would remain **significant and unavoidable with mitigation**.
>
> As mentioned, the Proposed Project would be built out over many years and has a flexible land use development program, and not all of the mitigation measures are needed at the outset of development. As a result, transit capacity and transit trip generation shall be monitored over time to determine whether the impacts materialize to the extent predicted.
>
> Based on the thresholds and the effective transit trip generation rates, the Project Sponsor would be required by the Planning Department to demonstrate with each building application whether the transit trips generated by the land use cumulatively proposed as a result of that application would cause any of the trip generation thresholds to be met, and if so, to provide the capital costs for the additional buses prior to occupancy of buildings within that application.

The Proposed Project and other reasonably foreseeable development expected by year 2040 would also cause the 22 Fillmore bus route to exceed 85 percent utilization in the Maximum Commercial Scenario during the AM and PM peak hours. The Proposed Project would contribute 43 percent of the ridership on this Muni route in the AM peak hour (outbound direction) and 35 percent of the ridership in the PM peak hour (inbound direction). This would be a considerable contribution to a significant cumulative impact on individual transit routes. Therefore, additional

mitigation would be necessary for the Maximum Commercial Scenario to reduce the considerable contribution to the significant cumulative impact on Muni service on this route.

Mitigation Measure TR-8B (COM): Increase capacity on the 22 Fillmore for SFMTA (Cumulative)

The project sponsor shall contribute funds for two additional vehicles to reduce the Proposed Project's contribution to the significant cumulative impact to not considerable. This shall be considered the Proposed Project's fair share toward mitigating this cumulative impact. If SFMTA adopts an alternate strategy to increase capacity along this route that does not involve purchasing and operating additional vehicles, the Proposed Project's fair share contribution shall remain the same, and may be used for one of those other strategies deemed desirable by SFMTA.

However, as with Mitigation Measure TR-1, because SFMTA cannot commit funding to operate additional buses on these routes, to expand bus zones, or to increase transit vehicle travel speeds until the elements are environmentally cleared, the implementation of Mitigation Measure TR-8A and TR-8B is uncertain, and the Proposed Project's contribution to the cumulative impact would remain **significant and unavoidable** under both project scenarios.

The T Third Outbound is projected to operate within the capacity utilization threshold during both peak hours under the Maximum Commercial Scenario and Maximum Residential Scenario. Therefore, the cumulative impact to this route is expected to be **less-than-significant**.

6.2.2 Regional Transit

As noted previously, the Proposed Project would add new transit trips to regional transit providers, including as many as 208 transit trips to the East Bay, 700 transit trips to the South Bay, and 80 transit trips to the North Bay. No regional transit providers are expected to exceed their established capacity utilization thresholds (see **Tables 33** and **34**). Therefore, the cumulative impacts to regional transit would be **less-than-significant**.

TABLE 31: MUNI DOWNTOWN SCREENLINES – AM PEAK HOUR (CUMULATIVE CONDITIONS)

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Util.	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast												
Kearny/Stockton	2,273	3,157	72%	7,394	9,473	78%	0	7,394	78%	0	7,394	78%
Other lines	710	1,141	62%	758	1,785	42%	54	812	45%	37	795	45%
Screenline Total	2,983	4,298	69%	*8,152*	*11,258*	72%	*54*	*8,206*	*73%*	*37*	*8,189*	*73%*
Northwest												
Geary	2,302	3,763	61%	2,673	3,763	71%	0	2,673	71%	0	2,673	71%
California	1,436	2,010	71%	1,989	2,306	**86%**	0	1,989	**86%**	0	1,989	**86%**
Sutter/Clement	514	630	82%	581	756	77%	0	581	77%	0	581	77%
Fulton/Hayes	1,505	2,237	67%	1,962	1,977	**99%**	0	1,962	**99%**	0	1,962	**99%**
Balboa	553	1,008	55%	690	1,008	68%	0	690	68%	0	690	68%
Screenline Total	6,310	9,648	65%	*7,895*	*9,810*	80%	*0*	*7,895*	*80%*	*0*	*7,895*	*80%*
Southeast												
Third Street	1,025	3,808	27%	2,422	5,712	42%	215	2,637	46%	152	2,574	45%
Mission	2,155	2,632	82%	3,117	3,008	**104%**	0	3,117	**104%**	0	3,117	**104%**
San Bruno/Bayshore	1,867	2,197	85%	1,952	2,197	**89%**	0	1,952	**89%**	0	1,952	**89%**
Other lines	1,577	1,756	90%	1,795	2,027	**89%**	81	1,876	**93%**	101	1,896	**94%**
Screenline Total	*6,624*	*10,393*	*64%*	*9,286*	*12,944*	72%	*296*	*9,582*	*74%*	*253*	*9,539*	*74%*
Southwest												
Subway lines	6,783	7,020	97%	6,314	7,020	**90%**	323	6,637	**95%**	410	6,724	**96%**
Haight/Noriega	1,178	1,596	74%	1,415	1,596	**89%**	0	1,415	**89%**	0	1,415	**89%**
Other lines	474	560	85%	175	560	31%	0	175	31%	0	175	31%
Screenline Total	8,435	9,176	92%	*7,904*	*9,176*	**86%**	*323*	*8,227*	***90%***	*410*	*8,314*	***91%***
Muni Screenlines Total	24,352	33,515	73%	*33,237*	*43,188*	77%	*673*	*33,910*	*79%*	*700*	*33,937*	*79%*
Individual Routes												
22 Fillmore IB	501	882	57%	539	882	61%	163	702	80%	129	668	76%
22 Fillmore OB	340	882	39%	455	882	52%	245	699.5	79%	350	804.5	**91%**
48 Quintara/24th Street IB	119	252	47%	95	252	38%	149	244	**97%**	118	213	85%

TABLE 31: MUNI DOWNTOWN SCREENLINES – AM PEAK HOUR (CUMULATIVE CONDITIONS)

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Util.	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
48 Quintara/24th Street OB	199	252	79%	244	252	**97%**	224	468	**186%**	319	563	**223%**
T Third IB	1,097	3,808	29%	1,554	5,712	27%	323	1,877	33%	410	1,964	34%
T Third OB	1,931	3,808	51%	3,327	5,712	58%	215	3,542	62%	152	3,479	61%

Notes: **Bold** indicates capacity utilization of 85 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

TABLE 32: MUNI DOWNTOWN SCREENLINES – PM PEAK HOUR (CUMULATIVE CONDITIONS)

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Util.	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
Northeast												
Kearny/Stockton	2,444	3,327	73%	6,295	8,329	76%	0	6,295	76%	0	6,295	76%
Other lines	903	1,155	78%	1,229	2,065	60%	71	1,300	63%	51	1,280	62%
Screenline Total	*3,347*	*4,482*	*75%*	*7,524*	*10,394*	*72%*	*71*	*7,595*	*73%*	*51*	*7,575*	*73%*
Northwest												
Geary	2,913	3,621	80%	2,996	3,621	83%	0	2,996	83%	0	2,996	83%
California	1,349	1,752	77%	1,766	2,021	**87%**	0	1,766	**87%**	0	1,766	**87%**
Sutter/Clement	523	630	83%	749	756	**99%**	0	749	**99%**	0	749	**99%**
Fulton/Hayes	1,544	1,838	84%	1,762	1,878	**94%**	0	1,762	**94%**	0	1,762	**94%**
Balboa	537	974	55%	776	974	80%	0	776	80%	0	776	80%
Screenline Total	6,866	8,815	78%	*8,049*	*9,250*	***87%***	*0*	*8,049*	***87%***	*0*	*8,049*	***87%***
Southeast												
Third Street	1,836	3,808	48%	2,300	5,712	40%	280	2,580	45%	208	2,508	44%
Mission	1,927	2,632	73%	2,673	3,008	**89%**	0	2,673	**89%**	0	2,673	**89%**
San Bruno/Bayshore	1,761	2,134	83%	1,817	2,134	**85%**	0	1,817	**85%**	0	1,817	**85%**
Other lines	1,213	1,675	72%	1,582	1,927	82%	76	1,658	**86%**	87	1,669	**87%**
Screenline Total	*6,737*	*10,249*	*66%*	*8,372*	*12,781*	*66%*	*356*	*8,728*	*68%*	*295*	*8,667*	*68%*
Southwest												
Subway lines	5,433	6,804	80%	5,692	6,804	84%	304	5,996	**88%**	354	6,046	**89%**
Haight/Noriega	1,065	1,596	67%	1,265	1,596	79%	0	1,265	79%	0	1,265	79%
Other lines	655	840	78%	380	840	45%	0	380	45%	0	380	45%
Screenline Total	*7,153*	*9,240*	*77%*	*7,337*	*9,240*	*79%*	*304*	*7,641*	*83%*	*354*	*7,691*	*83%*
Muni Screenlines Total	*24,103*	*32,786*	*74%*	*31,282*	*41,665*	*75%*	*731*	*32,013*	*77%*	*700*	*31,982*	*77%*
Individual Routes												
22 Fillmore IB	436	939	46%	549	939	58%	230	779	83%	301	850	**91%**

TABLE 32: MUNI DOWNTOWN SCREENLINES – PM PEAK HOUR (CUMULATIVE CONDITIONS)

Muni Screenline	Baseline			Cumulative			Cumulative Plus Project – Residential			Cumulative Plus Project – Commercial		
	Ridership	Capacity	Util.	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
22 Fillmore OB	400	939	43%	512	939	55%	213	725	77%	177	689	73%
48 Quintara/24th Street IB	160	252	63%	184	252	73%	211	395	**157%**	274	458	**182%**
48 Quintara/24th Street OB	213	252	85%	175	252	69%	196	371	**147%**	161	336	**133%**
T Third IB	1,940	3,808	51%	3,758	5,712	66%	280	4,038	71%	208	3,966	69%
T Third OB	1,742	3,808	46%	2,219	5,712	39%	304	2,523	44%	354	2,573	45%

1. Notes: **Bold** indicates capacity utilization of 85 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

TABLE 33: REGIONAL TRANSIT SCREENLINES – CUMULATIVE PLUS PROJECT CONDITIONS (AM PEAK HOUR)

Regional Screenline	Existing Conditions (Inbound)			Cumulative Conditions (Inbound)			Cumulative Plus Project Conditions (Inbound) – Residential			Cumulative Plus Project Conditions (Inbound) – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay												
BART	19,716	22,050	89%	32,608	33,170	98%	137	32,745	99%	177	32,785	99%
AC Transit	1,568	2,829	55%	7,000	12,000	58%	16	7,016	58%	21	7,021	59%
Ferries	810	1,170	69%	4,682	5,940	79%	8	4,690	79%	10	4,692	79%
Screenline Total	*22,094*	*26,049*	*85%*	*44,290*	*51,110*	*87%*	*161*	*44,451*	*87%*	*208*	*44,498*	*87%*
North Bay												
Golden Gate Transit Bus	1,330	2,543	52%	1,990	2,543	78%	66	2,056	81%	80	2,070	81%
Ferries	1,082	1,959	55%	1,619	1,959	83%	0	1,619	83%	0	1,619	83%
Screenline Total	*2,412*	*4,502*	*54%*	*3,609*	*4,502*	*80%*	*66*	*3,675*	*82%*	*80*	*3,689*	*82%*
South Bay												
BART	10,682	14,910	72%	13,942	24,182	58%	149	14,091	58%	172	14,114	58%
Caltrain	2,171	3,100	70%	2,310	3,600	64%	435	2,745	76%	516	2,826	79%
SamTrans	255	520	49%	271	520	52%	11	282	54%	12	283	54%
Ferries	-	-	-	59	200	30%	0	59	30%	0	59	30%
Screenline Total	*13,108*	*18,530*	*71%*	*16,582*	*28,502*	*58%*	*595*	*17,177*	*60%*	*700*	*17,282*	*61%*
Regional Screenlines Total	*37,614*	*49,081*	*77%*	*64,481*	*84,114*	*77%*	*822*	*65,303*	*78%*	*988*	*65,469*	*78%*

Notes: **Bold** indicates capacity utilization of 100 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

TABLE 34: REGIONAL TRANSIT SCREENLINES – CUMULATIVE PLUS PROJECT CONDITIONS (PM PEAK HOUR)

Regional Screenline	Existing Conditions (Outbound)			Cumulative Conditions (Outbound)			Cumulative Plus Project Conditions (Outbound) – Residential			Cumulative Plus Project Conditions (Outbound) – Commercial		
	Ridership	Capacity	Utilization	Ridership	Capacity	Utilization	Project Trips	Ridership	Utilization	Project Trips	Ridership	Utilization
East Bay												
BART	19,716	22,050	89%	30,383	33,170	92%	129	30,512	92%	152	30,535	92%
AC Transit	2,256	3,926	57%	7,000	12,000	58%	15	7,015	58%	18	7,018	58%
Ferries	805	1,615	50%	5,319	5,940	90%	8	5,327	90%	9	5,328	90%
Screenline Total	*22,777*	*27,591*	*83%*	*42,702*	*51,110*	*84%*	*152*	*42,854*	*84%*	*179*	*42,881*	*84%*
North Bay												
Golden Gate Transit Bus	1,384	2,817	49%	2,070	2,817	73%	62	2,132	76%	69	2,139	76%
Ferries	968	1,959	49%	1,619	1,959	83%	0	1,619	83%	0	1,619	83%
Screenline Total	*2,352*	*4,776*	*49%*	*3,689*	*4,776*	*77%*	*62*	*3,751*	*79%*	*69*	*3,758*	*79%*
South Bay												
BART	10,682	14,910	72%	13,971	24,182	58%	50	14,021	58%	53	14,024	58%
Caltrain	2,377	3,100	77%	2,529	3,600	70%	409	2,938	82%	444	2,973	83%
SamTrans	141	320	44%	150	320	47%	10	160	450%	11	161	50%
Ferries	-	-	-	59	200	30%	0	59	30%	0	59	30%
Screenline Total	*13,200*	*18,330*	*72%*	*16,709*	*28,302*	*59%*	*469*	*17,178*	*61%*	*508*	*17,217*	*61%*
Regional Screenlines Total	*38,330*	*50,697*	*76%*	*63,100*	*84,188*	*75%*	*683*	*63,783*	*76%*	*756*	*63,856*	*76%*

Notes: **Bold** indicates capacity utilization of 100 percent or greater.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2015. See Appendix D for Transit Line Capacity Calculations.

6.3 PEDESTRIAN IMPACTS

Pedestrian circulation impacts by their nature are site-specific and generally do not contribute to impacts from other development projects. As indicated in Section 5.4, the Proposed Project would not result in overcrowding of crosswalks or sidewalks or create new potentially hazardous conditions for pedestrians with the construction of Mitigation Measure TR-2 (RES/COM). The Proposed Project would improve pedestrian circulation adjacent to the Proposed Project site by creating new sidewalks and adding to the Blue Greenway. Internal roadways are proposed to be two-lane roadways with all-way stop-controlled intersections, aiding pedestrian circulation. Although several recently constructed, proposed, and/or approved projects in the area such as the Warriors Stadium, UCSF Hospital, and the Mission Rock development could contribute to demand for the surrounding pedestrian network, they would all provide new facilities in the vicinity, which would improve the overall pedestrian network. Additionally, these projects are not located close enough to one another such that generated walking trips would frequently overlap and overcrowd the adjacent facilities. Therefore, for the above reasons, the Proposed Project, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative impacts on pedestrians.

6.4 BICYCLE IMPACTS

Bicycling trips in the area may increase between the completion of the Proposed Project and the cumulative scenario due to general growth in the area. There is a projected increase in vehicles at intersections in the vicinity of the Proposed Project, which may result in an increase in vehicle-bicycle conflicts at intersections in the study area.

Additionally, the Golden State Warriors Arena and Event Center project is proposing to relocate Terry A. Francois Boulevard as part of the Mission Bay Infrastructure Plan[29]. The relocation would be completed by the project's master infrastructure developer, Mission Bay Development Group. It would include replacing the existing bicycle lane in each direction with a 13-foot wide two-way separated bicycle lane (i.e., cycle track) on the east side of the street, and the existing bicycle lane on the west side of Terry A. Francois Boulevard will be removed. A four-foot raised buffer will separate the bicycle lane from the adjacent eight-foot wide parking lane. With the provision of a cycle track, and as Mission Bay gets built out along Terry A. Francois Boulevard to the north and south of the Proposed Project site, it is anticipated that some bicyclists currently traveling on Third Street would instead travel on the improved bicycle facility on Terry A. Francois Boulevard (Third Street is not a designated bicycle route, and on Third Street bicyclists share the travel lane with vehicles). The signal at Terry A. Francois Boulevard / Illinois Street / Mariposa Street would include bicycle signals to connect the Terry A. Francois Boulevard cycle track to Illinois Street and Mariposa Street.While there would be a general increase in vehicle traffic that is expected through the future 2040 Cumulative conditions, the Proposed Project would not create potentially hazardous conditions for bicycles, or otherwise interfere with bicycle accessibility to the site and adjoining areas. Proposed Project elements would require that the points of access to bicycle parking include signage indicating the location of these facilities, avoiding conflicts with private cars and loading vehicles accessing the Proposed Project driveways, and facilitating access to bicycle routes through on-site signage. Therefore, for the above reasons, the Proposed Project, in

[29] Based on the Golden State Warriors Arena and Event Center EIR (Planning Department Case No. 2014.1441E, OCII Case No. ER 2014-919-97), this relocation would occur in time for the 2018-2019 season.

combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative impacts on bicyclists.

6.5 LOADING IMPACTS

Loading impacts are by their nature localized and site-specific, and they would not contribute to impacts from other development projects near the Proposed Project site. The Proposed Project provides appropriate loading facilities for the anticipated demand. Therefore, the Proposed Project, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative loading impacts.

6.6 EMERGENCY VEHICLE ACCESS IMPACTS

The Proposed Project would not contribute considerably to cumulative emergency vehicle access conditions in the area. With implementation of the Proposed Project, emergency vehicle access to the Proposed Project site would remain unchanged from existing conditions, except for the addition of the 21st Street connection with Illinois Street. With implementation of transit-only lanes and changes to the number and direction of travel lanes on streets in the vicinity of the Proposed Project, emergency vehicle providers may adjust travel routes to respond to incidents; however, emergency vehicle access in the area would not be substantially affected. Emergency vehicles would be permitted full use of transit-only lanes and would not be subject to any turn restrictions. Therefore, for the above reasons, the Proposed Project, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative emergency vehicle access impacts.

6.7 CONSTRUCTION IMPACTS

The construction of the Proposed Project may overlap with the construction of other projects listed in Section 6.1. Overall, localized cumulative construction-related transportation effects could occur as a result of cumulative projects that generate increased traffic at the same time and on the same roads as the Proposed Project. The construction manager for each project would work with the various departments of the City to develop a detailed and coordinated plan that would address construction vehicle routing, traffic control, and pedestrian movement adjacent to the construction area for the duration of any overlap in construction activity. As mentioned, because of the size of the Proposed Project site, much of the construction activity can be completed on-site. Because the Orton Historic Core redevelopment and Crane Cove Park development border the Proposed Project site, coordination will be necessary with those projects to ensure that traffic control and vehicle routing is appropriate throughout the Mission Bay area.

The cumulative impacts of multiple nearby construction projects would not be cumulatively considerable, as the construction would be of temporary duration, and the Project sponsor would coordinate with various City departments such as SFMTA and DPW through the Transportation Advisory Staff Committee (TASC) to develop coordinated plans that would address construction-related vehicle routing and pedestrian movements adjacent to the construction area for the duration of construction overlap. Therefore, for the above reasons, the Proposed Project, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative construction-related transportation impacts.

6.8 PARKING IMPACTS

Considering cumulative parking conditions, over time, due to the land use development and increased density anticipated within the City, parking demand and competition for on- and off-street parking is likely to increase. Consistent with the City's Transit First Policy, the City's Better Streets program and related projects, the Proposed Project provides on-site parking, though the forecasted demand is higher than the proposed supply. The parking shortfall associated with Proposed Project's parking demand would need to be accommodated in nearby on-street public parking, and, as a result, the parking occupancy in the study area would increase.

7 INTERSECTION AND FREEWAY OPERATIONS ANALYSIS (FOR INFORMATIONAL DISCUSSION ONLY)

As discussed previously in this report, traffic congestion is no longer considered a significant impact under CEQA in San Francisco. However, in recognition that some discussion of traffic operations may be of interest to City staff, decision-makers, and the public, this report includes a comprehensive study of the potential effects of the Proposed Project on vehicle circulation. This chapter includes a discussion of both local roadway intersection and freeway operations for informational purposes only.

The operating characteristics of intersections are evaluated using the concept of Level of Service ("LOS"). LOS is a qualitative description of driver comfort and convenience. Most often, an intersection's average delay per vehicle is used as a quantitative proxy for LOS. Intersection levels of service range from LOS A, which indicates free flow or unimpeded vehicle flow conditions with short delays, to LOS F, which indicates congested or overloaded vehicle flow conditions with extremely long delays. In San Francisco, LOS A through D are considered acceptable, and LOS E and LOS F are considered unsatisfactory service levels. The intersections were evaluated using the *2000 Highway Capacity Manual* (HCM) methodology.[30] As noted above, automobile delay information is presented in this Chapter 7 for informational purposes only.

Table 35 and **Table 36** summarize the relationship between average delay per vehicle and LOS for signalized and unsignalized intersections according to the 2000 HCM method. Twenty-one of the 37 existing study intersections are signalized. Seven intersections are all-way stop controlled, and the remaining eight are stop-controlled for side-street vehicles.

For signalized intersections, this methodology determines the capacity for each lane group approaching the intersection. The LOS is based on average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS is presented for the intersection. For unsignalized intersections, operations are defined by the average control delay per vehicle (in seconds per vehicle) for each stop-controlled movement or movement that must yield the right-of-way. Control delay and corresponding LOS for the approach with the highest delay is reported. Delay LOS ranges are lower for unsignalized intersections than for signalized intersections because drivers expect to incur less delay at unsignalized intersections.

[30] As part of the HCM methodology, adjustments are typically made to the capacity of each intersection to account for various factors that reduce the ability of the streets to accommodate vehicles (such as the downtown nature of the study area, number of pedestrians, vehicle type, lane widths and queues). These adjustments are performed to ensure that the LOS analysis results reflect the operating conditions that are observed in the field. See **Appendix K** for adjustments made at study intersections.

TABLE 35: SIGNALIZED INTERSECTION LOS CRITERIA		
Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0
B	Operations with low delay occurring with good progression and short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0

Source: Highway Capacity Manual – Special Report 209 (Transportation Research Board, 2000).

TABLE 36: UNSIGNALIZED INTERSECTION LOS CRITERIA		
Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no traffic delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: Highway Capacity Manual – Special Report 209 (Transportation Research Board, 2000).

Similar to intersections, the operating characteristics of freeway merge and diverge segments are evaluated using the concept of LOS. Freeway ramp merge and diverge section LOS is based on vehicle density (passenger cars per lane-mile) using the relationships presented in **Table 37**. Freeway ramp density is calculated using the methods described in Chapter 13 of the Highway Capacity Manual. In San Francisco, LOS A through D are considered acceptable; LOS E and LOS F are considered unsatisfactory service levels.

Service volume is the primary measure used to evaluate operations of weaving sections. For weaving sections, the specific service volume, and thus level of service, is prescribed by the weaving volume, number of lanes, and length of weave. The service volume is calculated with the aid of nomographs published in *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, by J Leisch, & Associates, September 1983.

TABLE 37: FREEWAY MERGE AND DIVERGE SEGMENT LOS CRITERIA

Level of Service	Description	Density (pc/mi/ln)
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	< 11
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 11 to 18
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 to 26
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 to 35
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 to 45
F	Represents a breakdown in flow.	> 45

Source: Highway Capacity Manual – Special Report 209 (Transportation Research Board, 2000).

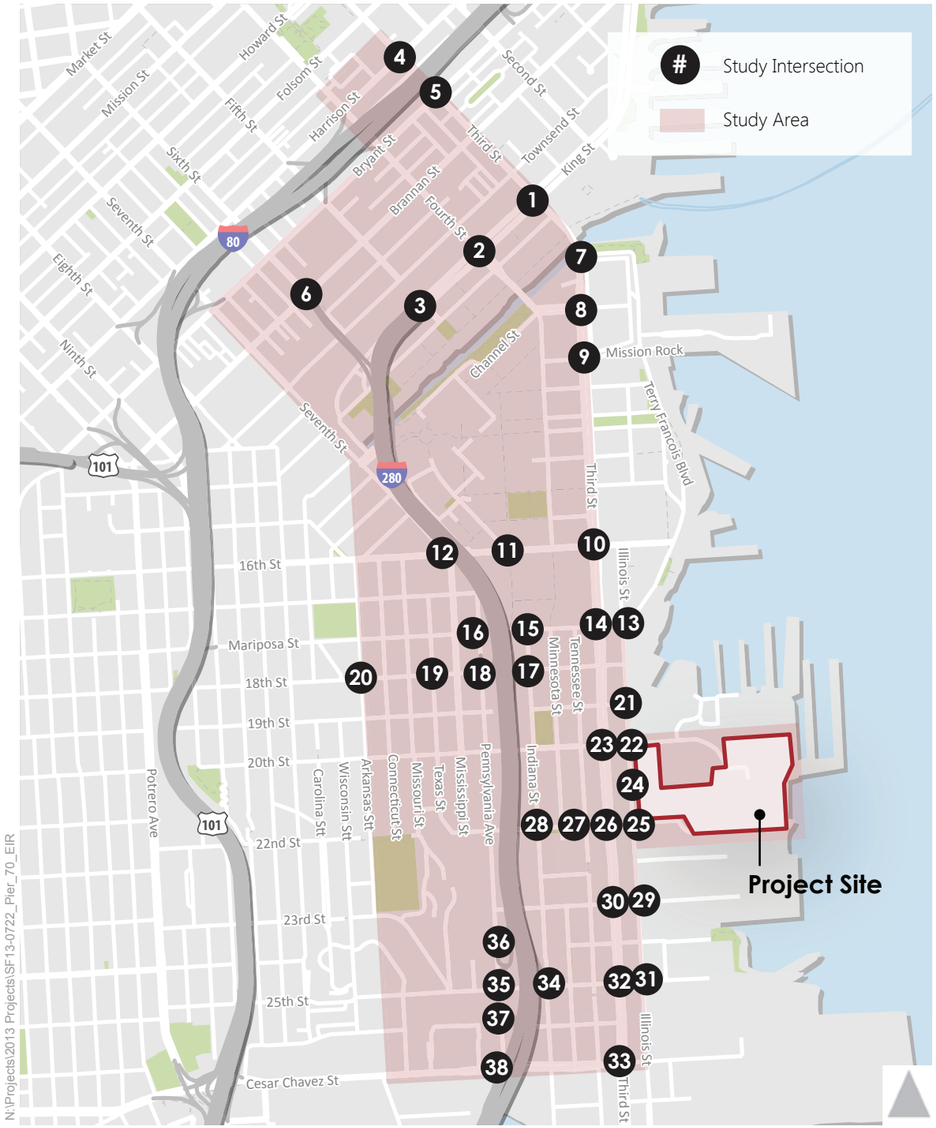
7.1 EXISTING CONDITIONS

This section includes descriptions of current intersection and freeway operating conditions.

7.1.1 Intersection Operations

This report evaluates intersection operating conditions during the weekday AM and PM peak periods. Thirty-eight study area intersections were selected for analysis through consultation with SFMTA staff, all but one of which were studied during both the near and long-term scenarios. The intersection of 21st Street / Illinois Street does not exist presently, and is evaluated with the Proposed Project only. These study intersections are shown in **Figure 3**.

Figure 11displays the existing peak hour traffic volumes for the peak periods studied, lane configurations and traffic controls (signal or stop) at each of the 37 existing study intersections. Traffic counts were obtained from previous transportation studies (see **Appendix J** for a summary of data sources and dates of data collection, as well as the intersection turning movement count sheets) within the study area or from new intersection turning movement counts conducted in September of 2013 and January of 2014. Additional data collection was done at five intersections in January 2015. Those counts validated the 2013 and 2014 data as the 2015 data were less than one percent different in the AM peak hour and approximately two percent higher in the PM peak hour. The 2013/2014 data have been used in this report, and the 2015 data are also available in **Appendix J**.



Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

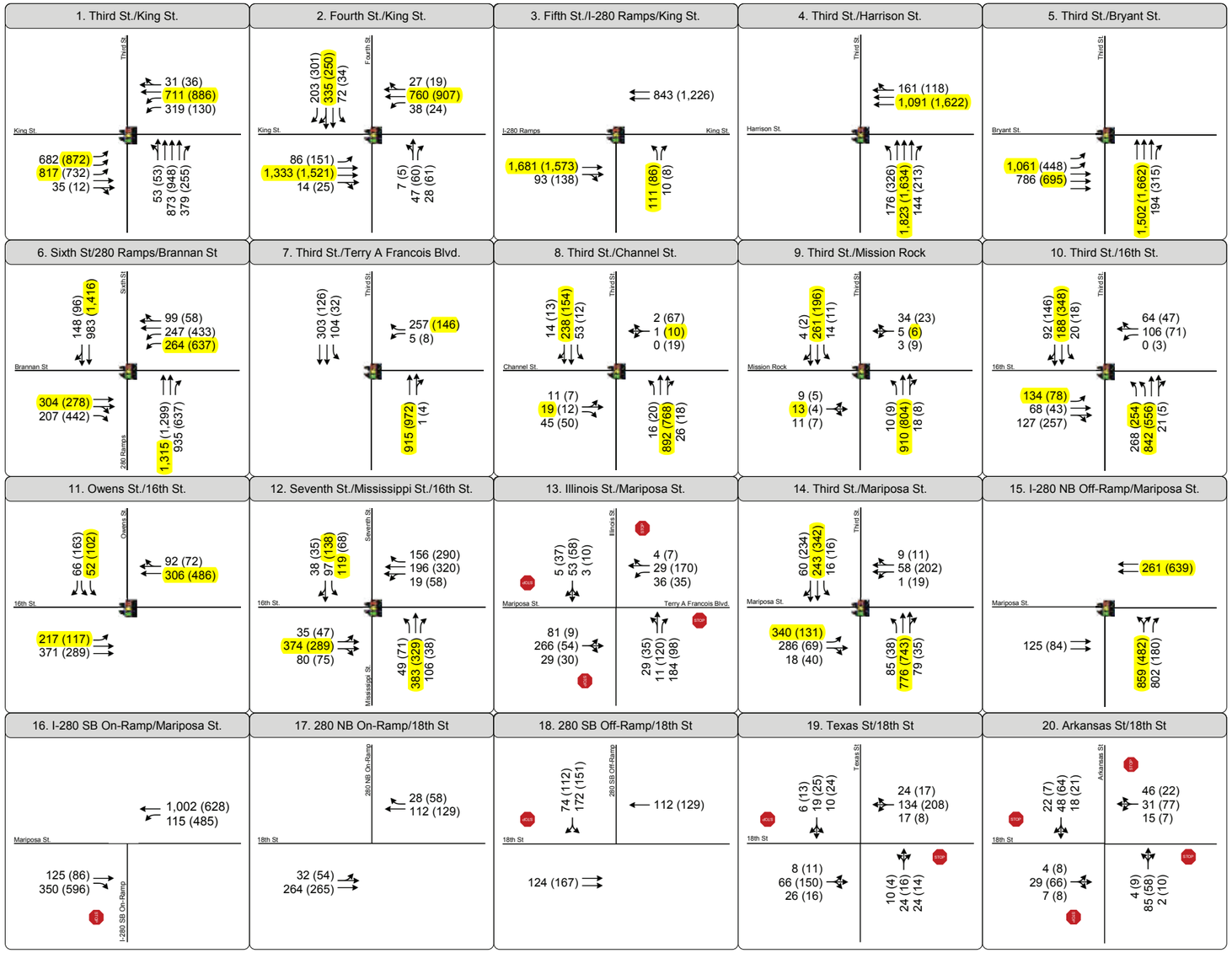
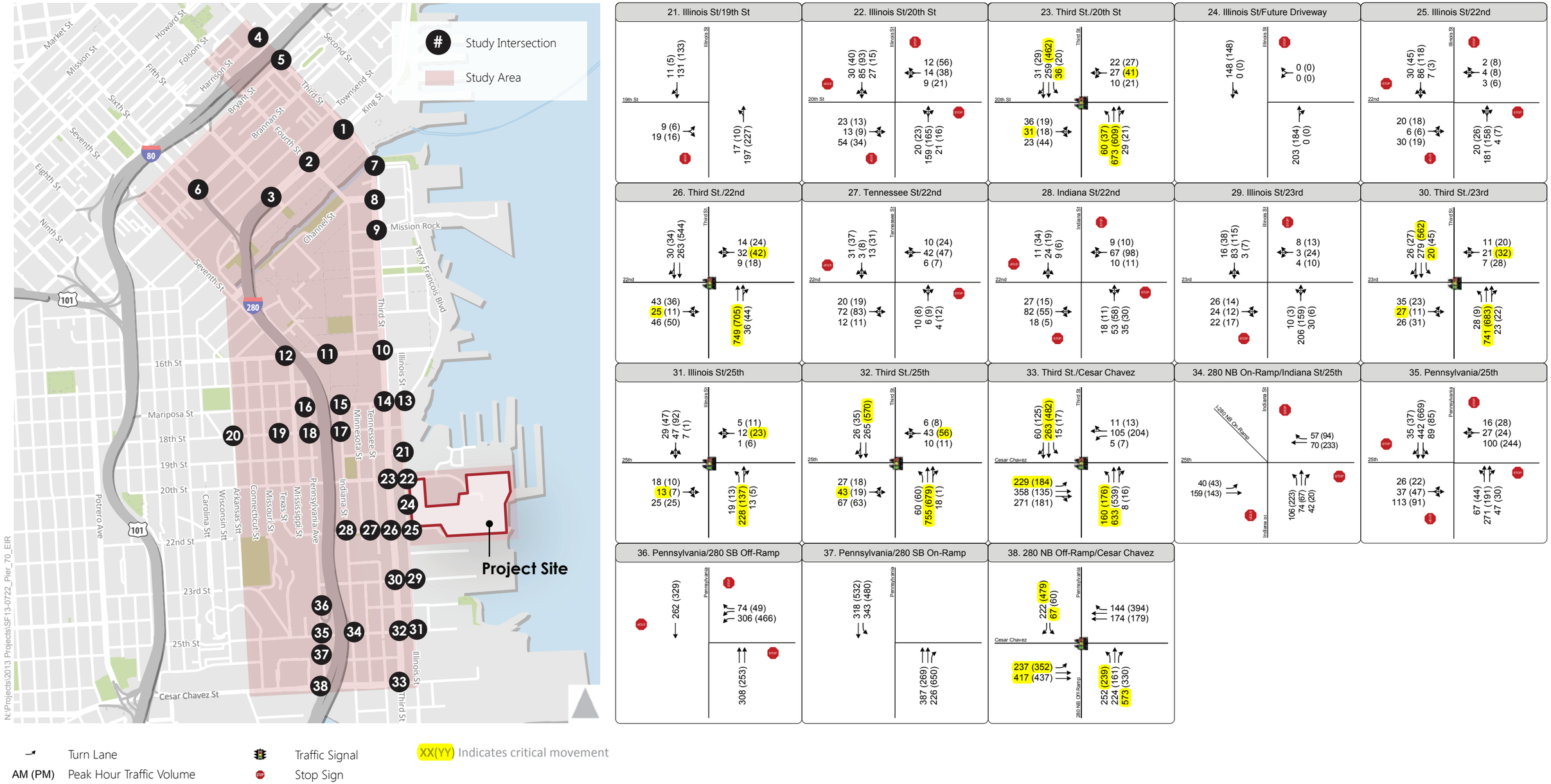


Figure 11A

Existing Peak Hour Lane Configurations, Traffic Control and Volumes



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

XX(YY) Indicates critical movement

Figure 11B

Existing Peak Hour Lane Configurations, Traffic Control and Volumes

The study intersections were observed during both AM and PM peak hours to determine locations where queue spillback from adjacent intersections affects the operations at the study intersections in a way that may not be accounted for in the traffic counts. PM peak period queues were observed and adjustments were made to the model (i.e., lane capacities and utilization) to reflect observed conditions where downstream congestion adversely affected study intersection operations in ways that many not be immediately obvious from the counts. These model adjustments are consistent with those made for the Mission Rock (SF Planning Department Case No. 2013.0208) and Golden State Warriors (SF Planning Department Case No. 2014.1441E) studies.

Table 38 presents the results of the existing conditions intersection LOS analysis and corresponding delay at each study intersection for the study weekday peak periods. As shown in the table, 35 of the 37 study intersections currently operate satisfactorily at LOS D or better during the AM peak hour. King Street / Fifth Street / I-280 Ramps and I-280 NB Off-Ramp / Mariposa Street both operate at LOS E during the AM peak hour.

Thirty-three of the 37 study intersections currently operate satisfactorily at LOS D or better during the PM peak hour. Two intersections operate at LOS E and two operate at LOS F during the PM period. Third Street / King Street and Third Street / Bryant Street both operate at LOS E during the PM peak hour, and Brannan Street / Sixth Street / I-280 Ramps and I-280 SB On-Ramp / Mariposa Street both operate at LOS F during the PM peak hour.

It should be noted that the intersection of 20th Street / Illinois Street is currently signalized but operates with flashing red signal heads in all directions at all times. As such, it has been evaluated as an all-way stop-controlled intersection throughout this document.

Intersection level of service calculation sheets are provided in **Appendix K**. Signal warrant analysis for unsignalized study intersections show that two unsignalized intersections currently meet peak hour warrants for signalization under existing conditions[31]:

- 25th Street / Pennsylvania Street (PM peak hour)
- Pennsylvania Street / I-280 Southbound Off-Ramp (PM peak hour)

[31] Note that meeting the peak hour signal warrant criteria is not necessarily indicative of the need for a traffic signal. A number of additional factors such as hourly traffic variation, traffic safety, and pedestrian volumes should be considered and the ultimate decision made by the City Traffic Engineer (and Caltrans where the intersection is ramp junction to a Caltrans facility). However, it is a reasonable indication of whether a signal may be worth investigating further and is presented here for informational purposes only.

TABLE 38: PEAK HOUR INTERSECTION LEVEL OF SERVICE – EXISTING CONDITIONS

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. King Street / Third Street	Signal	40	D	**79**	**E**
2. King Street / Fourth Street	Signal	39	D	52	D
3. King Street / Fifth Street / I-280 Ramps	Signal	**58**	**E**	37	D
4. Third Street / Harrison Street	Signal	27	C	32	C
5. Third Street / Bryant Street	Signal	24	C	**57**	**E**
6. Sixth Street / Brannan Street / I-280 Ramps	Signal	39	D	**>80**	**F**
7. Third Street / Terry A. Francois Boulevard	Signal	15	B	12	B
8. Third Street / Channel Street	Signal	37	D	27	C
9. Third Street / Mission Rock Street	Signal	37	D	21	C
10. 16th Street / Third Street	Signal	24	C	22	C
11. 16th Street / Owens Street	Signal	12	B	21	C
12. 16th Street / Seventh Street / Mississippi Street	Signal	24	C	35	D
13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.	AWSC	22 (EB)	C	10 (SB)	B
14. Mariposa Street / Third Street	Signal	35	D	26	C
15. Mariposa Street / I-280 NB Off-Ramp	Signal	**61**	**E**	23	C
16. Mariposa Street / I-280 SB On-Ramp	SSSC	11 (EB)	B	**>50 (EB)**	**F**
17. 18th Street / I-280 Northbound On-Ramp	SSSC	1 (EB)	A	1 (EB)	A
18. 18th Street / I-280 Southbound Off-Ramp	SSSC	13 (SB)	B	13 (SB)	B
19. 18th Street / Texas Street	SSSC	12 (SB)	B	16 (SB)	C
20. 18th Street / Arkansas Street	AWSC	8 (NB)	A	8 (SB)	A
21. 19th Street / Illinois Street	SSSC	10 (EB)	B	10 (EB)	B
22. 20th Street / Illinois Street	AWSC	9 (NB)	A	9 (NB)	A
23. 20th Street / Third Street	Signal	15	B	12	B
24. 21st Street / Illinois Street (future)	-	-	-	-	-
25. 22nd Street / Illinois Street	AWSC	9 (NB)	A	9 (NB)	A
26. 22nd Street / Third Street	Signal	7	A	9	A
27. 22nd Street / Tennessee Street	SSSC	12 (NB)	B	12 (SB)	B
28. 22nd Street / Indiana Street	AWSC	8 (EB)	A	8 (WB)	A
29. 23rd Street / Illinois Street	SSSC	12 (EB)	B	12 (WB)	B
30. 23rd Street / Third Street	Signal	10	A	10	B
31. 25th Street / Illinois Street	Signal	8	A	9	A
32. 25th Street / Third Street	Signal	14	B	13	B
33. Cesar Chavez Street / Third Street	Signal	25	C	38	D
34. 25th Street / Indiana Street / I-280 Northbound On-Ramp	AWSC	10 (EB)	A	13 (WB)	B
35. 25th Street / Pennsylvania Street	AWSC	16 (SB)	C	31 (SB)	D
36. Pennsylvania Street / I-280 Southbound Off-Ramp	AWSC	14 (SB)	B	18 (SB)	C
37. Pennsylvania Street / I-280 Southbound On-Ramp	SSSC	5 (SB)	A	5 (SB)	A
38. Cesar Chavez Street / Pennsylvania Street / I-280 NB Off	Signal	42	D	49	D

Notes: **Bold** indicates intersection operations at LOS E or LOS F. AWSC = all-way stop control. SSSC = side-street stop control.

1. Average delay reported as seconds per vehicle.
2. For signalized intersections, LOS based on average intersection delay calculated using 2000 HCM methodology. For unsignalized intersections, LOS based on worst approach (indicated in parentheses).

Source: Fehr & Peers, 2015.

7.1.2 Freeway Ramp Operations

This section examines operating conditions on selected freeway sections in the study area during the weekday AM and PM peak hours. Freeway segments are classified in four major categories. Merge segments are defined as the section of freeway after two traffic streams join together. Diverge segments are defined as the section of freeway before one traffic streams splits to create two traffic streams. Weaving segments are generally defined as the crossing of two or more traffic streams traveling in the same direction along a substantial length of highway without the aid of traffic control devices. Thus, weaving segments are formed when merge segments are followed by diverge segments so closely that there is not sufficient distance between the merge and diverge segments for them to operate independently. Additionally, these sections evaluate only the acceleration/deceleration/auxiliary lanes and the outside two lanes of the freeway mainline for a distance of 1,500 feet downstream of a merge point or upstream of a diverge point. The last category, basic freeway segments, encompasses all remaining freeway segments. Because of the density of freeway ramps in the study area, no basic segments have been identified.

Analyzed freeway segments include the following weaving segment, on-ramp merge sections, and off-ramp diverge sections.

Freeway weave sections:

- SB I-280 Sixth Street on-ramp (with SB I-280 King Street on-ramp)

Freeway on-ramp merge sections:

- NB I-280 18th Street on-ramp
- NB I-280 Indiana Street / 25th Street on-ramp
- SB I-280 Mariposa Street on-ramp
- SB I-280 Pennsylvania Street / 25th Street on-ramp
- SB I-280 Pennsylvania Street / Cesar Chavez Street on-ramp

Freeway off-ramp diverge sections:

- NB I-280 Sixth Street off-ramp
- NB I-280 Mariposa Street off-ramp
- SB I-280 18th Street off-ramp
- SB I-280 Pennsylvania Street / Cesar Chavez Street off-ramp

Traffic volumes for the study ramps were collected from previous transportation studies within the study area or from new intersection turning movement counts conducted in the September of 2013 and January of 2014. Intersection turning movement count sheets are provided in **Appendix J**. Freeway mainline volumes were verified against Caltrans Performance Measurement System (PeMS) data. **Table 39** presents the resulting LOS and corresponding density at the freeway ramps.

TABLE 39: FREEWAY LEVELS OF SERVICE – EXISTING CONDITIONS					
Freeway Segment	Facility Type	AM Peak Hour		PM Peak Hour	
		Density[1]	LOS[2]	*Density*[1]	LOS[2]
Northbound I-280					
Sixth Street off-ramp	Ramp Diverge	12	B	11	B
Mariposa Street off-ramp	Ramp Diverge	25	C	25	C
18th Street on-ramp	Ramp Merge	18	B	16	B
Indiana Street / 25th Street on-ramp	Ramp Merge	28	C	20	C
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	34	D	30	D
Southbound I-280					
Sixth Street on-ramp	Weave	1,234	C	**1,951**	**F**
Mariposa Street on-ramp	Ramp Merge	17	B	29	D
18th Street off-ramp	Ramp Diverge	14	B	22	C
Pennsylvania Street / 25th Street on-ramp	Ramp Merge	19	B	33	D
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	20	B	31	D

Notes:

1. Density of vehicles per segment. Measured in passenger cars per mile per lane (pc/mi/ln). Service volume shown for weaving segment.
2. Segments operating at LOS E or LOS F conditions highlighted in **bold.**

Source: Fehr & Peers, 2015.

During the weekday AM and PM peak hours, all of the ramp merge and diverge sections currently operate at LOS D or better. In the southbound direction, the weave segment where the Sixth Street on-ramp and the King Street on-ramp converge operates at LOS F. Freeway level of service calculation sheets are provided in **Appendix L**.

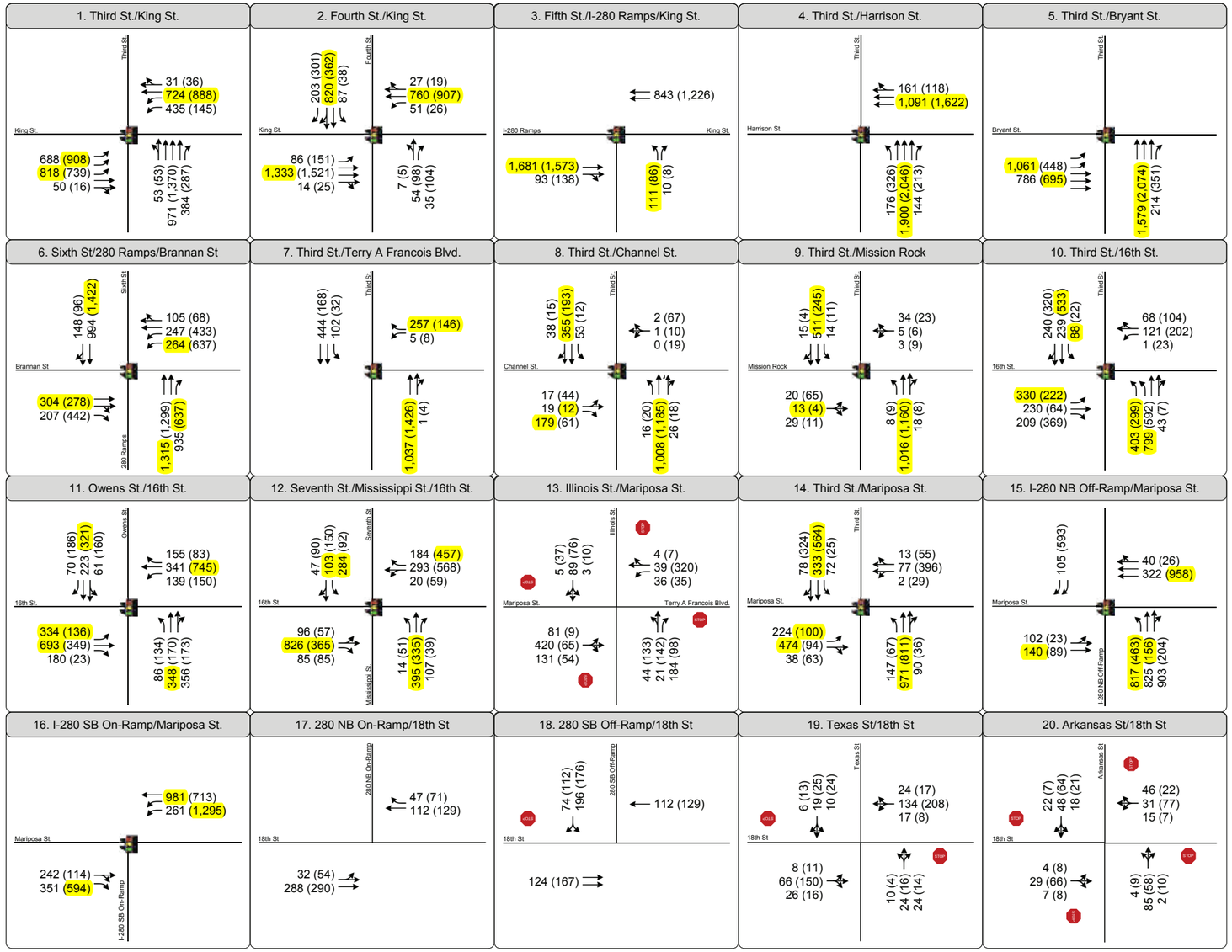
7.2 BASELINE CONDITIONS

7.2.1 Intersection Operations

Figure 12 displays the baseline peak hour traffic volumes for the peak periods studied, lane configurations and traffic controls (signal or stop) at each study intersection. These volumes reflect the projects mentioned earlier that are approved, under construction, or have been built since the counts were collected. Baseline vehicle volumes were developed using trip assignment from the various approved traffic studies and environmental documents for the respective projects, where available (these accounted for approximately 80 percent of the additional vehicle trips). In situations where detailed trip assignment from traffic studies was not available, documents were reviewed to determine if trip generation and distribution information were available, and trip assignment was completed to be consistent with the other project assumptions. For remaining projects, trip generation estimates were developed using *SF Guidelines* and Institute of Transportation Engineers (ITE) *Trip Generation, 9th Edition*.

Table 38 presents the results of the Baseline Conditions intersection LOS analysis and corresponding delay at each study intersection for the study weekday peak periods with the projects that are approved, under construction, or have been built since the counts were collected. Baseline conditions also take into account roadway network changes resulting from the transportation projects listed in Chapter 3.

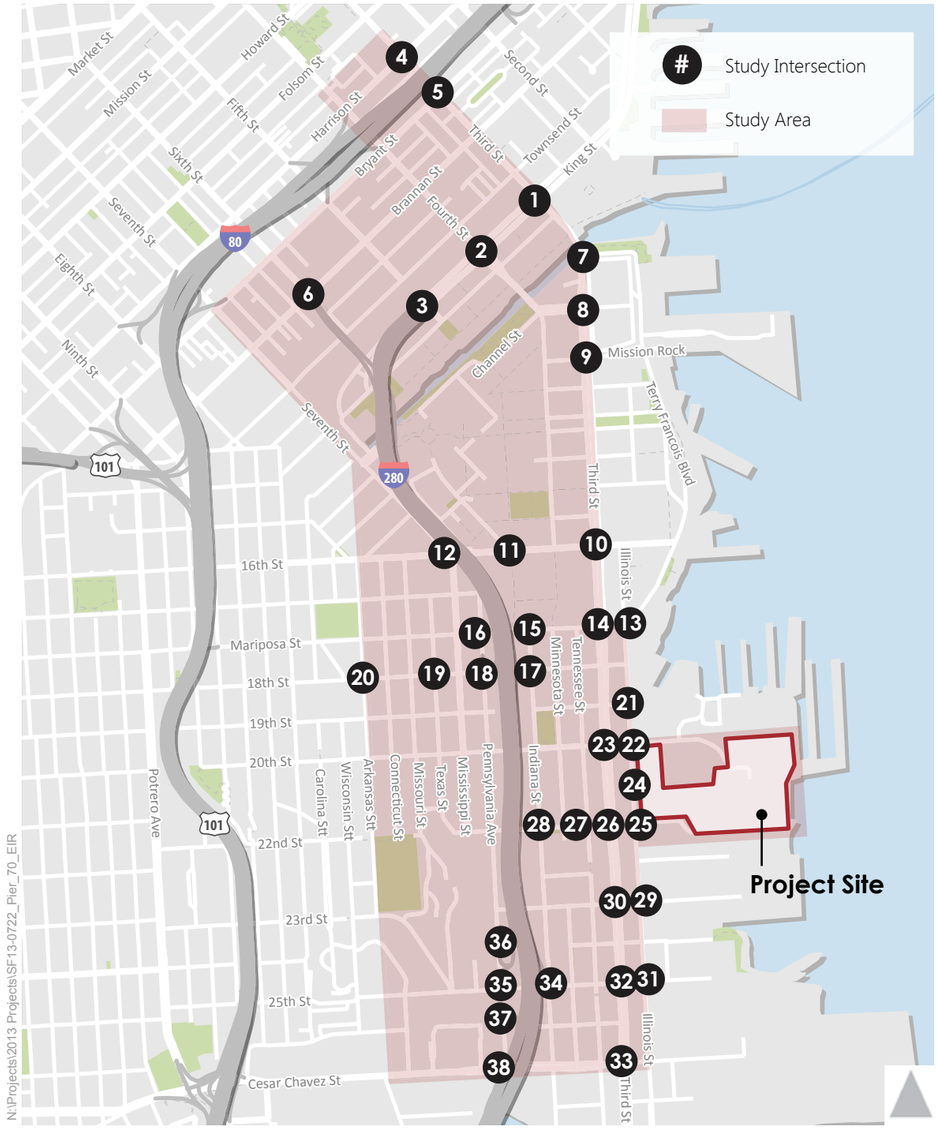


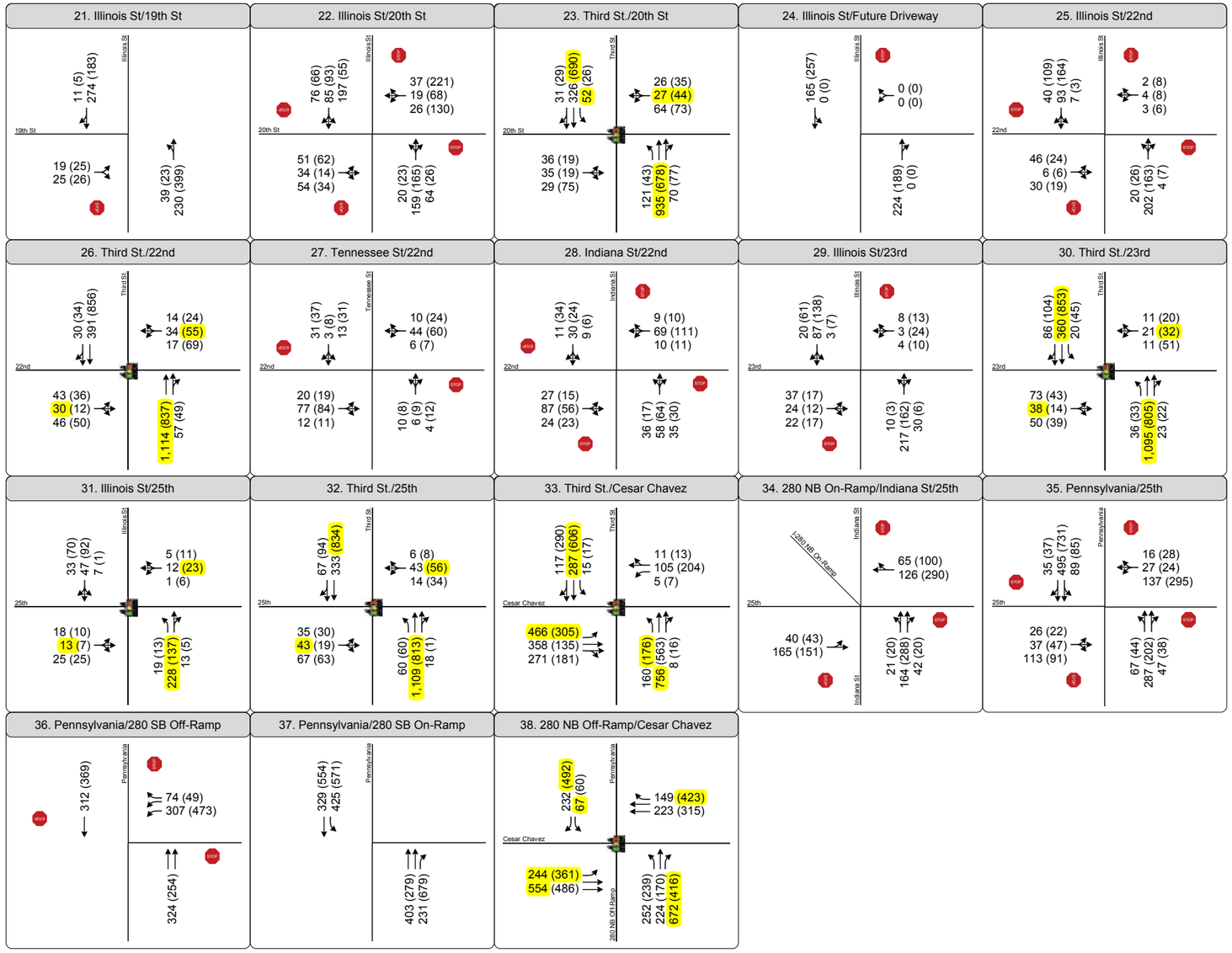


Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

Figure 12A

Baseline Peak Hour Lane Configurations, Traffic Control and Volumes





Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

Figure 12B

Baseline Peak Hour Lane Configurations, Traffic Control and Volumes

TABLE 40: PEAK HOUR INTERSECTION LEVEL OF SERVICE – BASELINE CONDITIONS

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay[1]	LOS[2]	Delay[1]	LOS[2]
1.	King Street / Third Street	Signal	44	D	**>80**	**F**
2.	King Street / Fourth Street	Signal	**58**	**E**	49	D
3.	King Street / Fifth Street / I-280 Ramps	Signal	**58**	**E**	37	D
4.	Third Street / Harrison Street	Signal	35	C	38	D
5.	Third Street / Bryant Street	Signal	31	C	**>80**	**F**
6.	Sixth Street / Brannan Street / I-280 Ramps	Signal	39	D	**>80**	**F**
7.	Third Street / Terry A. Francois Boulevard	Signal	15	B	16	B
8.	Third Street / Channel Street	Signal	**60**	**E**	**77**	**E**
9.	Third Street / Mission Rock Street	Signal	52	D	**71**	**E**
10.	16th Street / Third Street	Signal	38	D	35	D
11.	16th Street / Owens Street	Signal	**64**	**E**	**>80**	**F**
12.	16th Street / Seventh Street / Mississippi Street	Signal	**>80**	**F**	**>80**	**F**
13.	Mariposa Street / Terry A. Francois Blvd. / Illinois St.	AWSC	**>50 (EB)**	**F**	19 (WB)	C
14.	Mariposa Street / Third Street	Signal	35	D	28	C
15.	Mariposa Street / I-280 NB Off-Ramp	Signal	29	C	41	D
16.	Mariposa Street / I-280 SB On-Ramp	***Signal***	12	B	20	B
17.	18th Street / I-280 Northbound On-Ramp	SSSC	1 (EB)	A	1 (EB)	A
18.	18th Street / I-280 Southbound Off-Ramp	SSSC	13 (SB)	B	14 (SB)	B
19.	18th Street / Texas Street	SSSC	12 (SB)	B	16 (SB)	C
20.	18th Street / Arkansas Street	AWSC	8 (NB)	A	8 (SB)	A
21.	19th Street / Illinois Street	***Signal***	10	B	12	B
22.	20th Street / Illinois Street	AWSC	14 (SB)	B	16 (WB)	C
23.	20th Street / Third Street	Signal	15	B	16	B
24.	21st Street / Illinois Street (future)	-	-	-	-	-
25.	22nd Street / Illinois Street	AWSC	9 (NB)	A	9 (SB)	A
26.	22nd Street / Third Street	Signal	7	A	20	B
27.	22nd Street / Tennessee Street	SSSC	12 (NB)	B	12 (SB)	B
28.	22nd Street / Indiana Street	AWSC	9 (EB)	A	8 (WB)	A
29.	23rd Street / Illinois Street	SSSC	12 (EB)	B	12 (WB)	B
30.	23rd Street / Third Street	Signal	11	B	15	B
31.	25th Street / Illinois Street	Signal	8	A	9	A
32.	25th Street / Third Street	Signal	13	B	15	B
33.	Cesar Chavez Street / Third Street	Signal	42	D	**>80**	**F**
34.	25th Street / Indiana Street / I-280 Northbound On-Ramp	AWSC	10 (EB)	A	15 (WB)	C
35.	25th Street / Pennsylvania Street	AWSC	19 (SB)	C	**48 (SB)**	**E**
36.	Pennsylvania Street / I-280 Southbound Off-Ramp	AWSC	16 (SB)	C	21 (SB)	C
37.	Pennsylvania Street / I-280 Southbound On-Ramp	SSSC	6 (SB)	A	5 (SB)	A
38.	Cesar Chavez Street / Pennsylvania Street / I-280 NB Off	Signal	**>80**	**F**	**61**	**E**

Notes:
Bold indicates intersection operations at LOS E or LOS F. ***Bold and italics*** indicates traffic control type change.
Baseline condition is a modified existing condition.

1. Average delay reported as seconds per vehicle.
2. For signalized intersections, LOS based on average intersection delay calculated using 2000 HCM methodology. For unsignalized intersections, LOS based on worst approach (indicated in parentheses).

TABLE 40: PEAK HOUR INTERSECTION LEVEL OF SERVICE – BASELINE CONDITIONS

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]

Source: Fehr & Peers, 2015.

As shown in the table, 30 of the 37 study intersections would operate satisfactorily at LOS D or better during the AM peak hour, and 27 of the 37 study intersections would operate satisfactorily at LOS D or better during the PM peak hour. Intersection level of service calculation sheets are provided in Appendix K. The changes in intersection LOS are due to additional traffic associated with the land use development described above, and the new transit lane on 16th Street that reduce vehicle capacity effectively limits vehicular capacity through the 16th Street corridor within the Proposed Project vicinity.

In addition to the intersections that currently operate at LOS E or F, under Baseline Conditions the following intersections would also deteriorate to unacceptable LOS:

- King Street / Fourth Street (AM peak hour) – due to additional development from surrounding developments
- Third Street / Channel Street (PM peak hour) – due to additional development from surrounding developments
- Third Street / Mission Rock Street (PM peak hour) – due to additional development from surrounding developments
- 16th Street / Owens Street (AM peak hour and PM peak hour) – due to capacity reduction with 16th Street transit-only lane
- 16th Street / Seventh Street / Mississippi Street (AM peak hour and PM peak hour) – due to capacity reduction with 16th Street transit-only lane
- Mariposa Street / Terry A. Francois Blvd. / Illinois St. (AM peak hour) – due to additional development from surrounding developments
- Cesar Chavez Street / Third Street (PM peak hour) – due to additional development from surrounding developments
- 25th Street / Pennsylvania Street (PM peak hour) – due to additional development from surrounding developments
- Cesar Chavez Street / Pennsylvania Street / I-280 NB Off-Ramp (AM peak hour and PM peak hour) – due to additional development from surrounding developments

Signal warrant analysis for these intersections show that the same two unsignalized intersections would meet peak hour warrants for signalization under Baseline Conditions as were identified in Existing Conditions:

- 25th Street / Pennsylvania Street (PM peak hour)

- Pennsylvania Street / I-280 Southbound Off-Ramp (PM peak hour)

7.2.2 Freeway Ramp Operations

Table 41 presents the resulting LOS and corresponding density and service volumes at the freeway ramp and weave sections for the study weekday peak periods under Baseline Conditions.

TABLE 41: FREEWAY LEVELS OF SERVICE – BASELINE CONDITIONS

Freeway Segment	Facility Type	AM Peak Hour		PM Peak Hour	
		Density /Service Volume [1,3]	LOS[2]	*Density/ Service Volume* [1, 3]	LOS[2]
Northbound I-280					
Sixth Street off-ramp	Ramp Diverge	12	B	11	B
Mariposa Street off-ramp	Ramp Diverge	**-**	**F**	26	C
18th Street on-ramp	Ramp Merge	18	B	16	B
Indiana Street / 25th Street on-ramp	Ramp Merge	**-**	**F**	21	C
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	**41**	**E**	29	D
Southbound I-280					
Sixth Street on-ramp	Weave	1,240	C	**1,954**	**F**
Mariposa Street on-ramp	Ramp Merge	18	B	**-**	**F**
18th Street off-ramp	Ramp Diverge	14	B	22	C
Pennsylvania Street / 25th Street on-ramp	Ramp Merge	20	C	**38**	**E**
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	20	C	34	D

Notes:

Baseline condition is a modified existing condition.

1. Density of vehicles per segment. Measured in passenger cars per mile per lane (pc/mi/ln). Service volume shown for weaving segment.
2. Segments operating at LOS E or LOS F conditions highlighted in **bold.**
3. No density value is presented for diverge or merge segments where the demand volume exceeds the capacity, per *2000 Highway Capacity Manual*.

Source: Fehr & Peers, 2015.

With the introduction of the Baseline projects described earlier, freeway conditions deteriorate in the northbound direction in the AM peak, with the Pennsylvania Street / Cesar Chavez Street off-ramp operating at LOS E, and two ramps experiencing volumes slightly over capacity resulting in LOS F (Mariposa Street off-ramp, and Indiana Street / 25th Street on-ramp). The changes in freeway segment LOS from the Existing Conditions results presented in Table 37 and the Baseline Conditions results presented in Table 39 are mainly reflective of the increased traffic from the

UCSF Hospital project, which adds almost 800 vehicle trips to the I-280 Northbound off-ramp at Mariposa Street (which affects mainline volumes at the Indiana Street / 25th Street on-ramp and the Pennsylvania Street / Cesar Chavez Street off-ramp).

During the AM peak hour, operations are LOS C or better in the AM peak hour in the southbound direction. Northbound, several ramps are over capacity: the Mariposa on-ramp to access I-280 northbound and the Indiana Street / 25th Street on-ramp operates at LOS F and the Pennsylvania Street / Cesar Chavez Street off-ramp operates at LOS E.

In the PM peak hour, all northbound ramps operate at LOS D or better. On the southbound ramps, the Sixth Street on-ramp weave and the Mariposa Street on-ramp are over capacity and operate at LOS F. The Pennsylvania Street / 25th Street on-ramp is near capacity and operates at LOS E. Much of the volume contributing to these degradations can be attributed to the vehicle trips generated by the UCSF Medical Center / Mission Bay Hospital / Mission Bay Hall project. Freeway level of service calculation sheets are provided in Appendix L.

7.3 INTERSECTION AND FREEWAY POTENTIAL MEASURE ANALYSIS

Under the CEQA significance criteria formerly used by the San Francisco Planning Department (2002 *San Francisco Transportation Impact Analysis Guidelines for Environmental Review* (SF Guidelines)), level of service (LOS) is a criterion used to assess whether a proposed project would result in significant impacts. The analysis was conducted for this Proposed Project to help identify locations for potential infrastructure improvements. Potential measures to modify the roadway network in response to the Proposed Project are noted for each location that incurs what would previously have been designated a significant impact based on the 2002 criteria. A discussion of their feasibility is also included, and if the potential measure has been identified to move forward, the responsible party and the Project Sponsor's share of the potential cost is noted.

Impact areas were analyzed for the Baseline Plus Project Conditions by adding net Proposed Project travel demand associated with the Proposed Project to Baseline Conditions. Below is the list of significance criteria formerly used by the San Francisco Planning Department to assess whether a Proposed Project would result in significant impacts to the transportation network.

7.3.1 Signalized Intersection Analysis Criteria

Signalized intersections where Proposed Project-related traffic causes the intersection level of service to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F were assessed to determine if there are feasible improvements. Intersections that operate at LOS E or F under existing conditions were also assessed, depending upon the magnitude of the Proposed Project's contribution to the worsening of the average delay per vehicle.

7.3.2 Unsignalized Intersection Analysis Criteria

Unsignalized intersections where Proposed Project-related traffic meets one of the following three criteria were assessed to determine if there are feasible improvements:

- Would cause the level of service at the worst approach to deteriorate from LOS D or better to LOS E or F and Caltrans peak hour traffic volume signal warrants would be met;

- Would cause Caltrans signal warrants to be met when the worst approach is already operating at LOS E or F;

- Or would contribute more than 5 percent to the worst approach in the case that the worst approach is already operating at LOS E or F and Caltrans signal warrants are already being met in the existing condition.

7.3.3 Freeway Analysis Criteria

With respect to the freeway merge/diverge/weave segment analysis, Caltrans' policy is to maintain freeway mainline and ramp operations at the LOS C/D threshold based on the Guide for the Preparation of Traffic Impact Studies (Caltrans, December 2002). However, Caltrans acknowledges that this may not always be feasible and if an existing facility is operating at less than the appropriate target LOS, the existing service level should be maintained. For purposes of this study, the City of San Francisco criteria have been applied; specifically, where project-related traffic causes the facility level of service to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F, those locations were assessed to determine if there are feasible improvements. In addition, locations at which the Proposed Project would contribute substantially (five percent or more) to freeway segment or ramp congestion operating at unacceptable levels (LOS E or LOS F) were assessed to determine if there are feasible improvements.

7.3.4 Intersection Analysis



The Proposed Project would generate 1,951 inbound and 1,303 outbound net new vehicle-trips (for a total of 3,254 net new vehicle trips) during the weekday AM peak hour and 1,883 inbound and 2,047 outbound net new vehicle-trips (for a total of 3,930 net new vehicle trips) during the weekday PM peak hour under the Maximum Residential Scenario. The Proposed Project would generate 2,506 inbound and 933 outbound net new vehicle-trips (for a total of 3,439 net new vehicle trips) during the weekday AM peak hour and 1,459 inbound and 2,465 outbound net new vehicle-trips (for a total of 3,924 net new vehicle trips) during the weekday PM peak hour under the Maximum Commercial Scenario.

All Project-generated vehicle trips were assigned to and from the Proposed Project driveways (see **Figure 7** for directional distribution of vehicle trips). The resulting Baseline Plus Project traffic volumes for the study intersections under the Maximum Residential Scenario are presented in **Figure 13**. The resulting Baseline Plus Project traffic volumes for the study intersections under the Maximum Commercial Scenario are presented in **Figure 14**.

Table 42 and **Table 43** present the Baseline Plus Project intersection levels of service for the weekday AM peak hour and PM peak hour for the Maximum Residential Scenario and Maximum Commercial Scenario, respectively. In general, the addition of vehicle trips associated with Proposed Project growth would result in increases in the average delay per vehicle at the study intersections, and in many cases the LOS designation would worsen.



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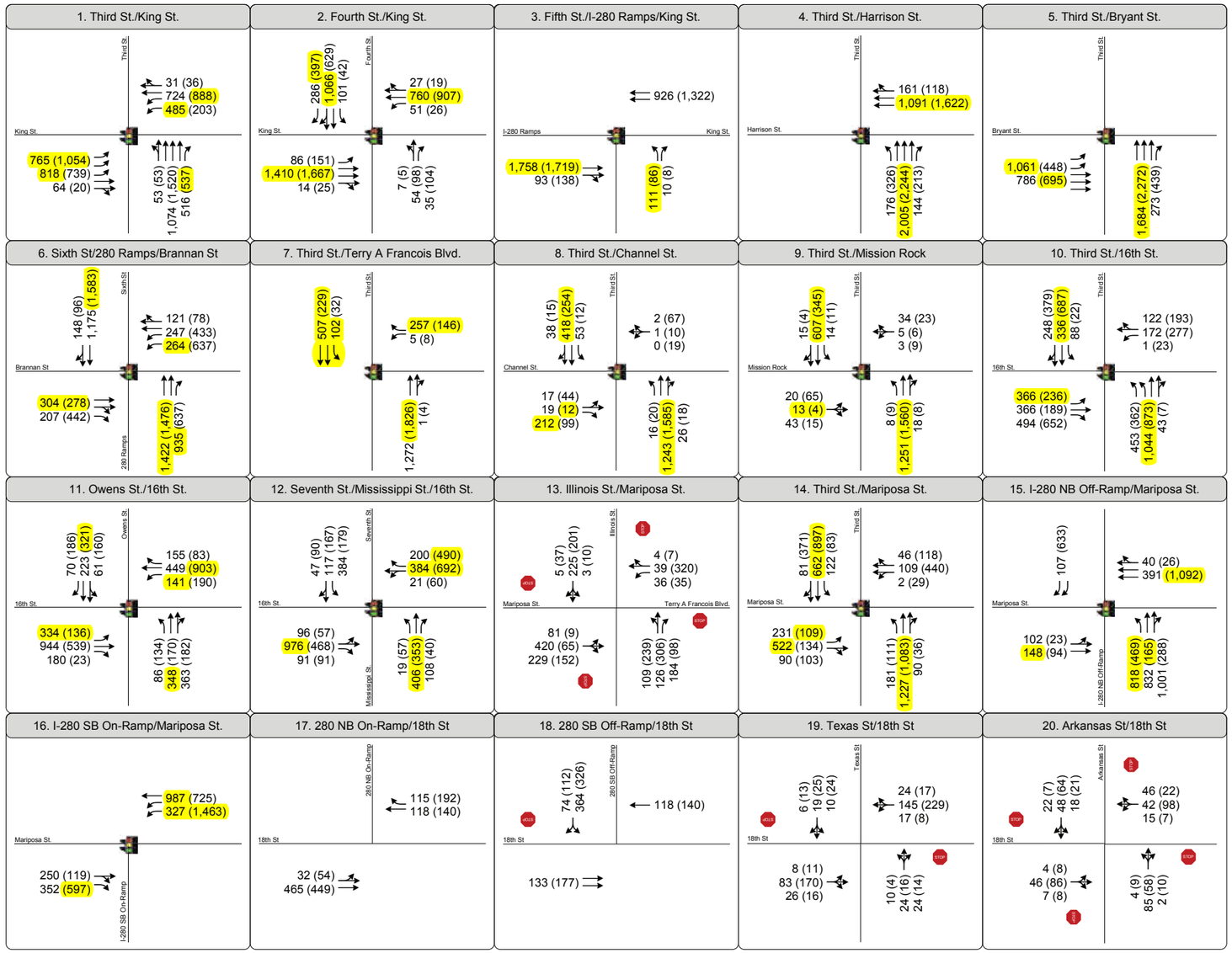
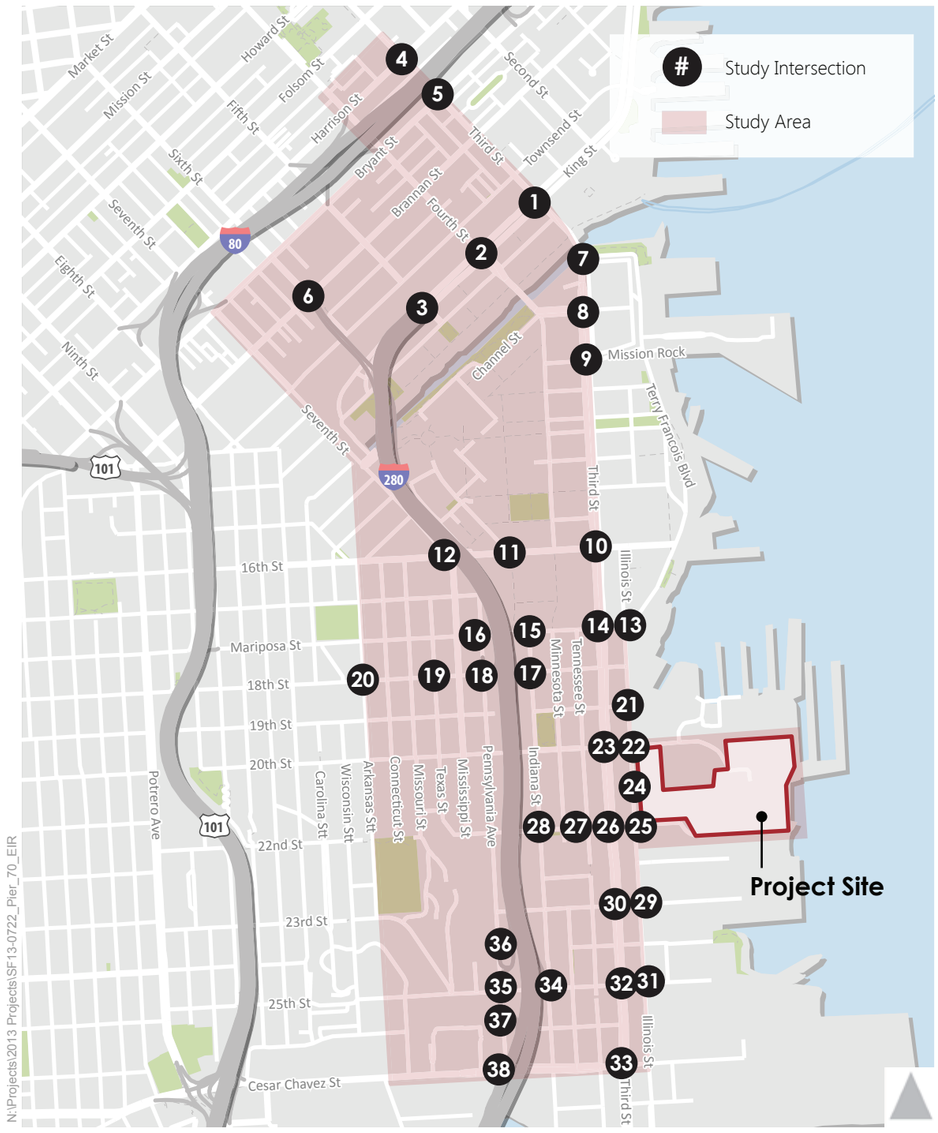


Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

Figure 13A

Baseline Plus Project Peak Hour Traffic Volumes - Maximum Residential Scenario



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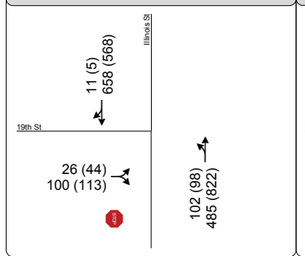
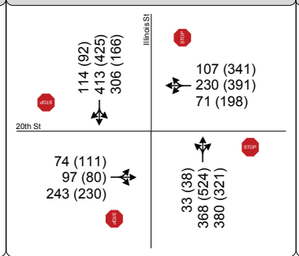
Turn Lane
Traffic Signal
AM (PM) Peak Hour Traffic Volume
Stop Sign
XX(YY) Indicates critical movement

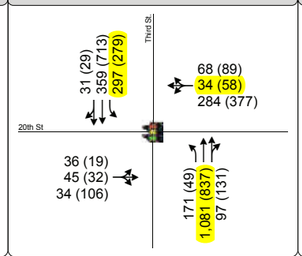
21. Illinois St/19th St



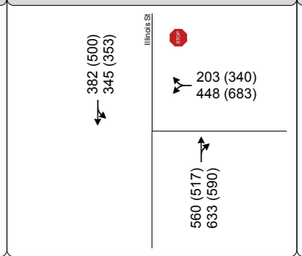
22. Illinois St/20th St



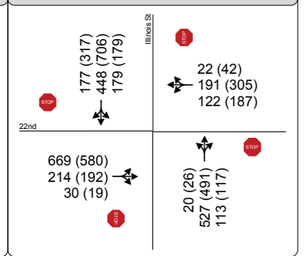
23. Third St./20th St



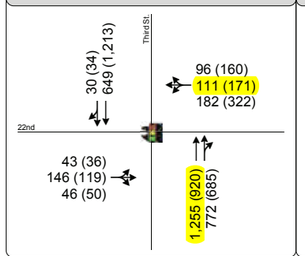
24. Illinois St/Future Driveway



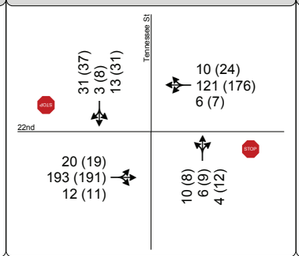
25. Illinois St/22nd



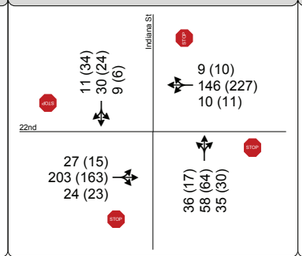
26. Third St./22nd



27. Tennessee St/22nd



28. Indiana St/22nd



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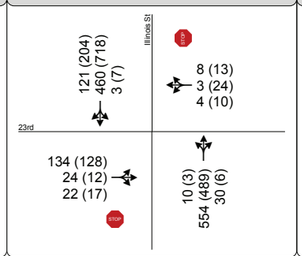
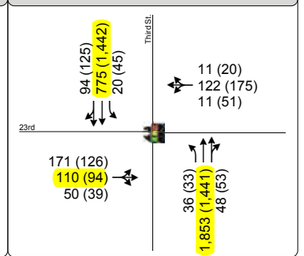
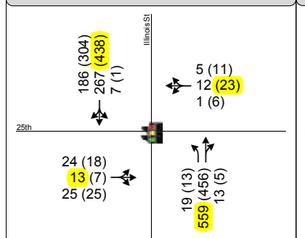


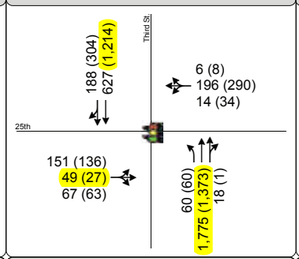
30. Third St./23rd



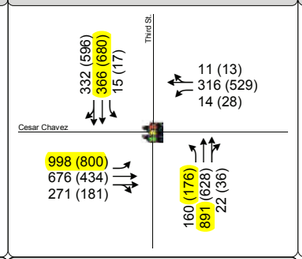
31. Illinois St/25th



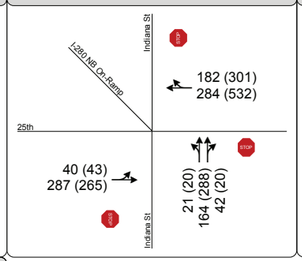
32. Third St./25th



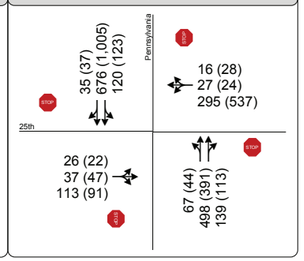
33. Third St./Cesar Chavez



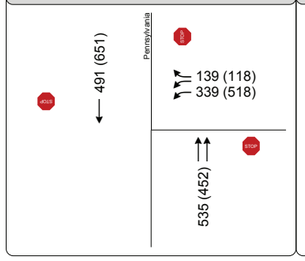
34. 280 NB On-Ramp/Indiana St/25th



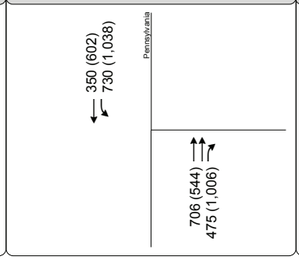
35. Pennsylvania/25th



36. Pennsylvania/280 SB Off-Ramp



37. Pennsylvania/280 SB On-Ramp



38. 280 NB Off-Ramp/Cesar Chavez

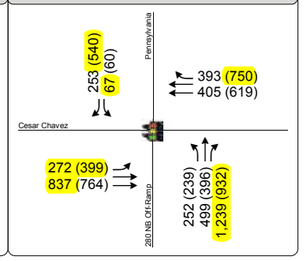
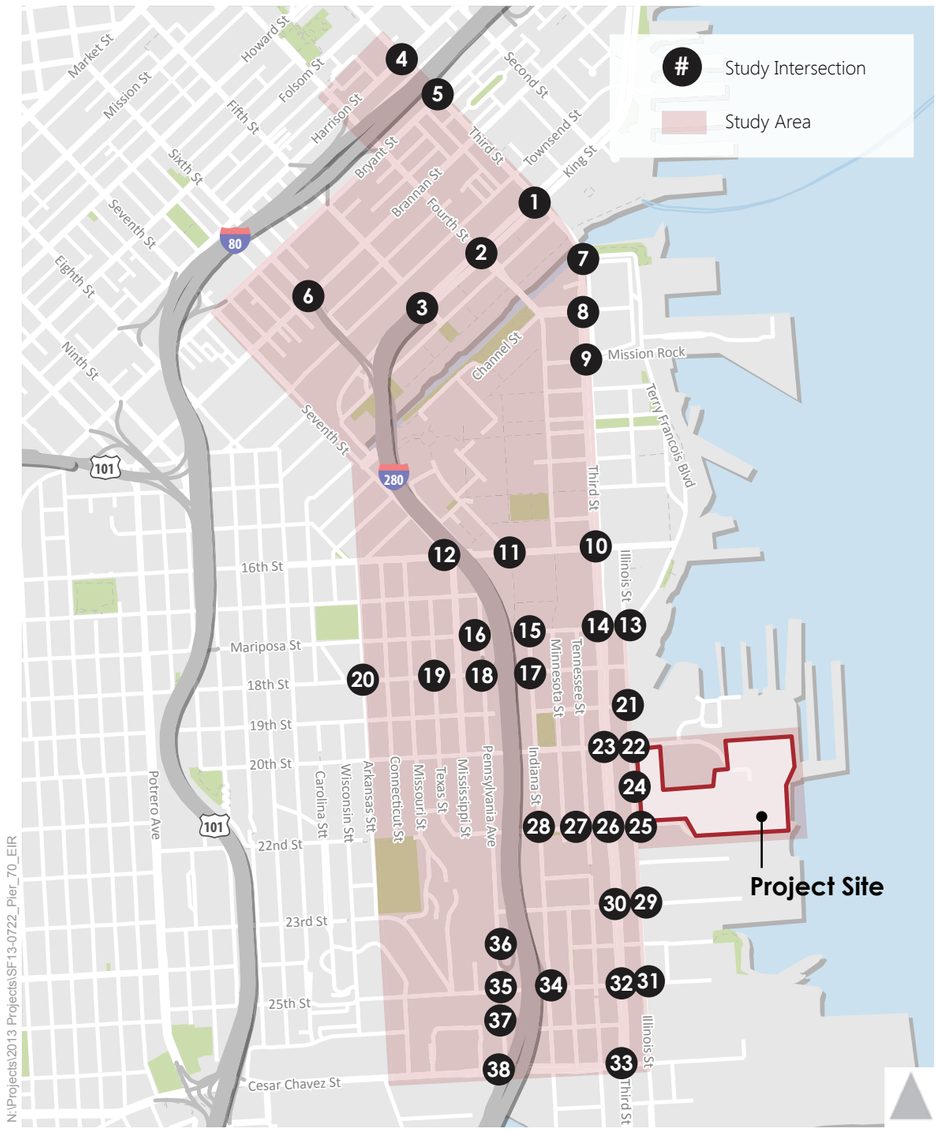


Figure 13 B

Baseline Plus Project Peak Hour Traffic Volumes - Maximum Residential Scenario



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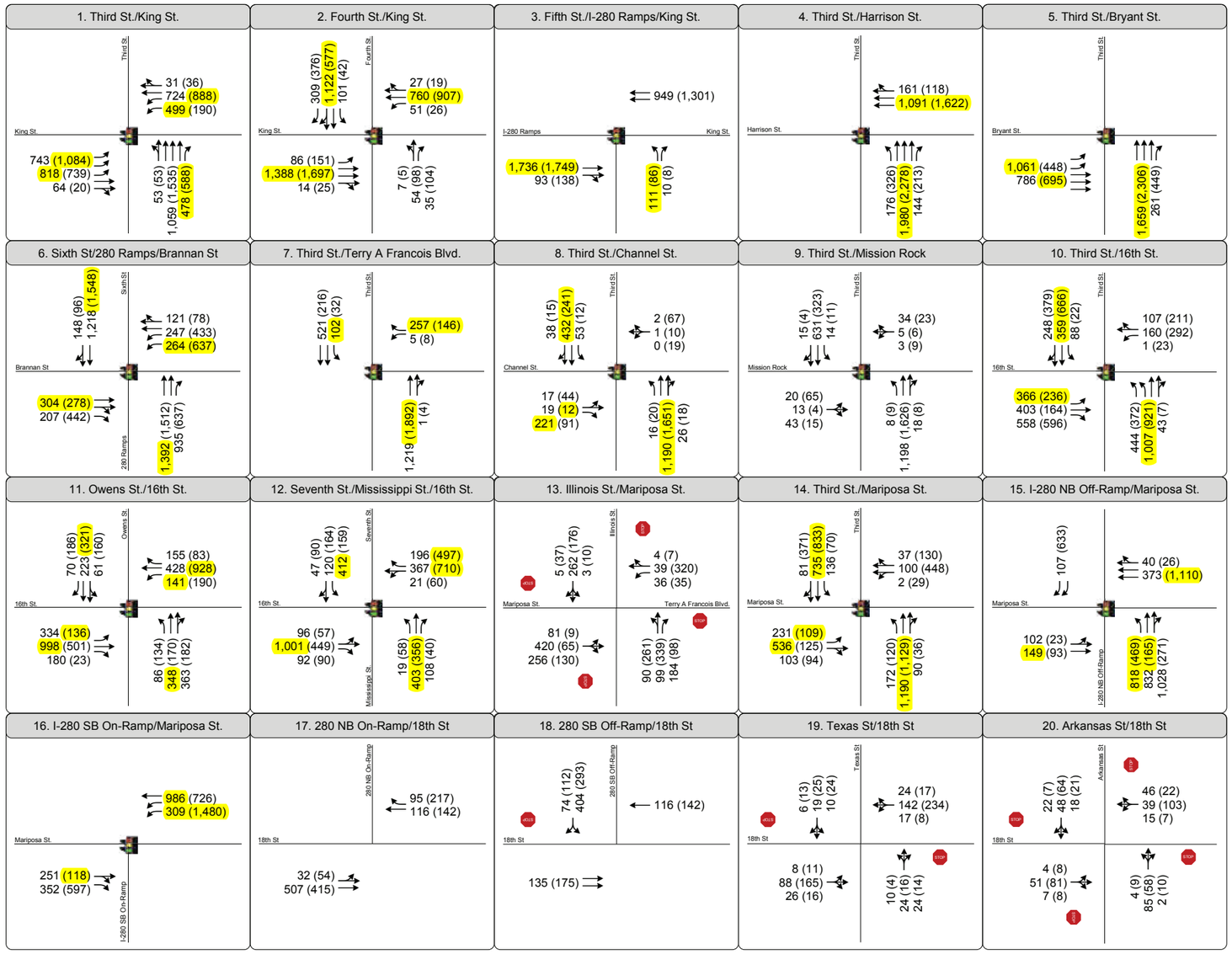
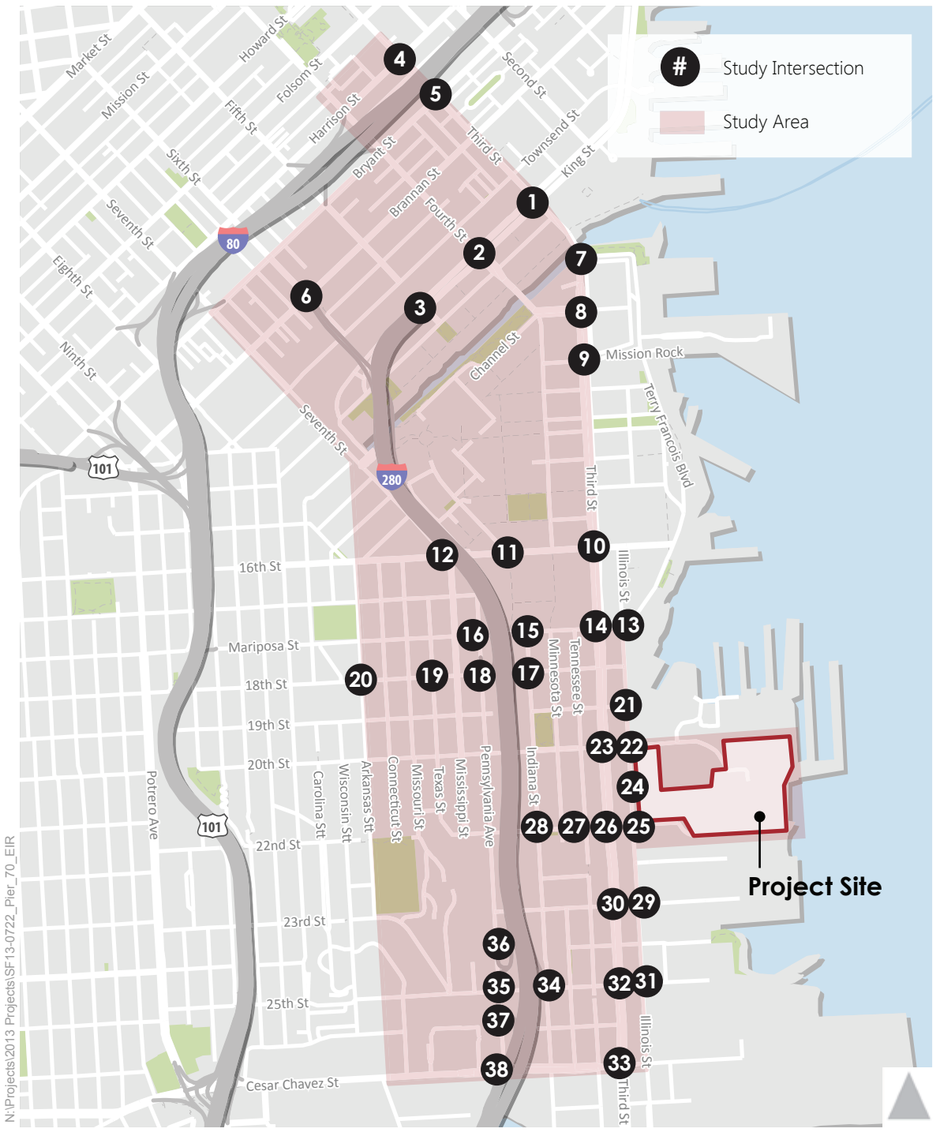


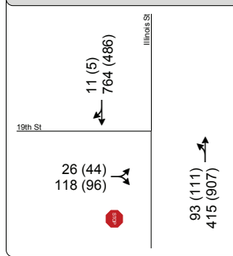
Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

Figure 14A

Baseline Plus Project Peak Hour Traffic Volumes - Maximum Commercial Scenario



21. Illinois St/19th St



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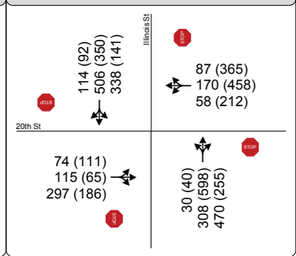
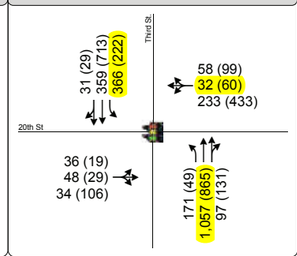
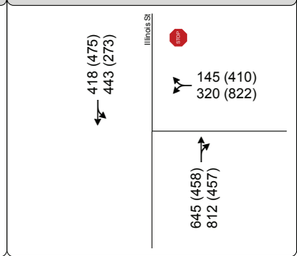


23. Third St./20th St



24. Illinois St/Future Driveway



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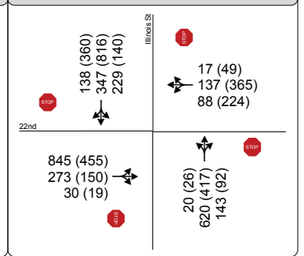

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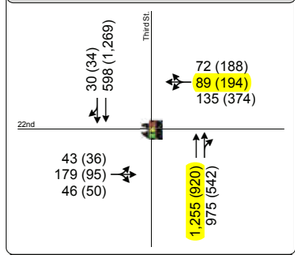
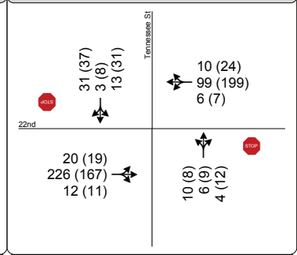
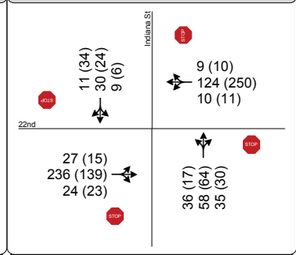


27. Tennessee St/22nd



28. Indiana St/22nd



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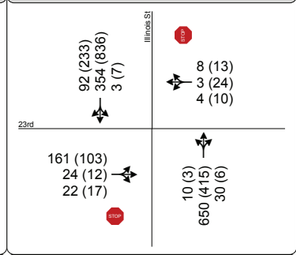

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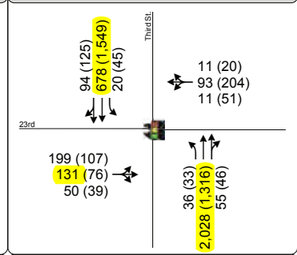
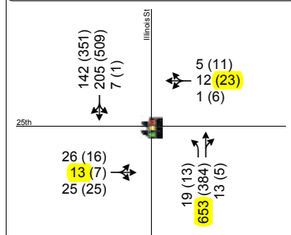
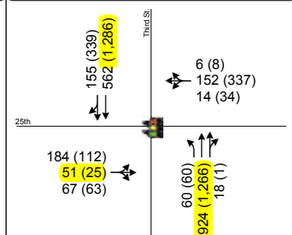


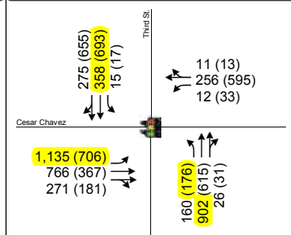
31. Illinois St/25th



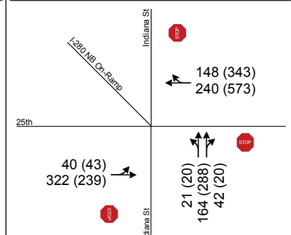
32. Third St./25th



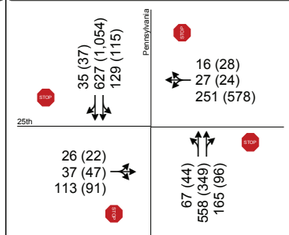
33. Third St./Cesar Chavez



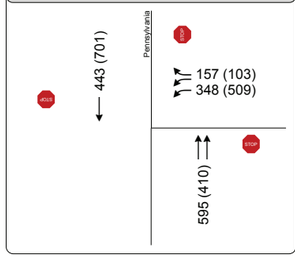
34. 280 NB On-Ramp/Indiana St/25th



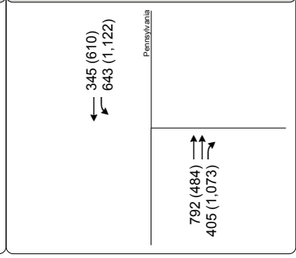
35. Pennsylvania/25th



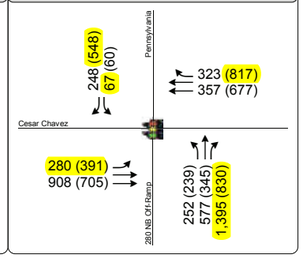
36. Pennsylvania/280 SB Off-Ramp



37. Pennsylvania/280 SB On-Ramp



38. 280 NB Off-Ramp/Cesar Chavez



Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

Figure 14B

Baseline Plus Project Peak Hour Traffic Volumes - Maximum Commercial Scenario

TABLE 42: WEEKDAY AM PEAK HOUR INTERSECTION LEVELS OF SERVICE - BASELINE PLUS PROJECT

Intersection	Traffic Control	Existing		Baseline[1]		Baseline Plus Project – Residential		Baseline Plus Project – Commercial	
		Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]
1. King Street / Third Street	Signal	40	D	44	D	**60**	**E**	**59**	**E**
2. King Street / Fourth Street	Signal	39	D	**58**	**E**	**>80**	**F**	**>80**	**F**
3. King Street / Fifth Street / I-280 Ramps	Signal	**58**	**E**	**58**	**E**	**69**	**E**	**65**	**E**
4. Third Street / Harrison Street	Signal	27	C	35	C	48	D	45	D
5. Third Street / Bryant Street	Signal	24	C	31	C	42	D	39	D
6. Sixth Street / Brannan Street / I-280 Ramps	Signal	39	D	39	D	53	D	53	D
7. Third Street / Terry A. Francois Boulevard	Signal	15	B	15	B	17	B	16	B
8. Third Street / Channel Street	Signal	37	D	**60**	**E**	**>80**	**F**	**>80**	**F**
9. Third Street / Mission Rock Street	Signal	37	D	52	D	**>80**	**F**	**>80**	**F**
10. 16th Street / Third Street	Signal	24	C	38	D	**70**	**E**	**64**	**E**
11. 16th Street / Owens Street	Signal	12	B	**64**	**E**	**>80**	**F**	**>80**	**F**
12. 16th Street / Seventh Street / Mississippi Street	Signal	24	C	**>80**	**F**	**>80**	**F**	**>80**	**F**
13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.	AWSC	22 (EB)	C	**>50 (EB)**	**F**	**>50 (EB)**	**F**	**>50 (EB)**	**F**
14. Mariposa Street / Third Street	Signal	35	D	35	D	**56**	**E**	**58**	**E**
15. Mariposa Street / I-280 NB Off-Ramp	Signal	**61**	**E**	29	C	30	C	31	C
16. Mariposa Street / I-280 SB On-Ramp	***SSSC/Signal***	11 (EB)	B	12	B	28	C	23	C
17. 18th Street / I-280 Northbound On-Ramp	SSSC	1 (EB)	A	1 (EB)	A	1 (EB)	A	1 (EB)	A
18. 18th Street / I-280 Southbound Off-Ramp	SSSC	13 (SB)	B	13 (SB)	B	21 (SB)	C	25 (SB)	D
19. 18th Street / Texas Street	SSSC	12 (SB)	B	12 (SB)	B	13 (SB)	B	13 (SB)	B
20. 18th Street / Arkansas Street	AWSC	8 (NB)	A	8 (NB)	A	8 (NB)	A	8 (NB)	A
21. 19th Street / Illinois Street	***SSSC/Signal***	10 (EB)	B	10	B	29	C	28	C

TABLE 42: WEEKDAY AM PEAK HOUR INTERSECTION LEVELS OF SERVICE - BASELINE PLUS PROJECT									
Intersection	Traffic Control	Existing		Baseline[1]		Baseline Plus Project – Residential		Baseline Plus Project – Commercial	
		Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]
22. 20th Street / Illinois Street	AWSC	9 (NB)	A	14 (SB)	B	**>50 (SB)**	**F**	**>50 (SB)**	**F**
23. 20th Street / Third Street	Signal	15	B	15	B	**>80**	**F**	**>80**	**F**
24. 21st Street / Illinois Street (future)	SSSC	-	-	-	-	**>50 (WB)**	**F**	**>50 (WB)**	**F**
25. 22nd Street / Illinois Street	AWSC	9 (NB)	A	9 (NB)	A	**>50 (EB)**	**F**	**>50 (EB)**	**F**
26. 22nd Street / Third Street	Signal	7	A	7	A	**>80**	**F**	**>80**	**F**
27. 22nd Street / Tennessee Street	SSSC	12 (NB)	B	12 (NB)	B	14 (NB)	B	15 (NB)	B
28. 22nd Street / Indiana Street	AWSC	8 (EB)	A	9 (EB)	A	9 (EB)	A	11 (EB)	B
29. 23rd Street / Illinois Street	SSSC	12 (EB)	B	12 (EB)	B	**>50 (EB)**	**F**	**>50 (EB)**	**F**
30. 23rd Street / Third Street	Signal	10	A	11	B	**>80**	**F**	**>80**	**F**
31. 25th Street / Illinois Street	Signal	8	A	8	A	11	B	21	C
32. 25th Street / Third Street	Signal	14	B	13	B	53	D	**80**	**E**
33. Cesar Chavez Street / Third Street	Signal	25	C	42	D	**>80**	**F**	**>80**	**F**
34. 25th Street / Indiana Street / I-280 NB On-Ramp	AWSC	10 (EB)	A	10 (EB)	A	18 (WB)	C	15 (EB)	B
35. 25th Street / Pennsylvania Street	AWSC	16 (SB)	C	19 (SB)	C	**>50 (SB)**	**F**	**>50 (NB)**	**F**
36. Pennsylvania Street / I-280 Southbound Off-Ramp	AWSC	14 (SB)	B	16 (SB)	C	**51 (SB)**	**F**	**38 (SB)**	**E**
37. Pennsylvania Street / I-280 Southbound On-Ramp	SSSC	5 (SB)	A	6 (SB)	A	33 (SB)	D	27 (SB)	D
38. Cesar Chavez Street / Pennsylvania St / I-280 NB Off	Signal	42	D	**>80**	**F**	**>80**	**F**	**>80**	**F**

Notes: **Bold** indicates intersection operations at LOS E or LOS F. ***Bold and italics*** indicates traffic control type change. AWSC = all-way stop control. SSSC = side-street stop control.

1. Baseline condition is a modified existing condition.
2. Delay reported as seconds per vehicle.
3. LOS = Level of Service. For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000.

Source: Fehr & Peers, 2015

TABLE 43: WEEKDAY PM PEAK HOUR INTERSECTION LEVELS OF SERVICE - BASELINE PLUS PROJECT

	Intersection	Traffic Control	Existing		Baseline[1]		Baseline Plus Project – Residential		Baseline Plus Project – Commercial	
			Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]
1.	King Street / Third Street	Signal	**79**	**E**	**>80**	**F**	**>80**	**F**	**>80**	**F**
2.	King Street / Fourth Street	Signal	52	D	49	D	52	D	53	D
3.	King Street / Fifth Street / I-280 Ramps	Signal	37	D	37	D	**56**	**E**	**61**	**E**
4.	Third Street / Harrison Street	Signal	32	C	38	D	**59**	**E**	**62**	**E**
5.	Third Street / Bryant Street	Signal	**57**	**E**	**>80**	**F**	**>80**	**F**	**>80**	**F**
6.	Sixth Street / Brannan Street / I-280 Ramps	Signal	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
7.	Third Street / Terry A. Francois Boulevard	Signal	12	B	16	B	28	C	34	C
8.	Third Street / Channel Street	Signal	27	C	**77**	**E**	**>80**	**F**	**>80**	**F**
9.	Third Street / Mission Rock Street	Signal	21	C	**71**	**E**	**>80**	**F**	**>80**	**F**
10.	16th Street / Third Street	Signal	22	C	35	D	**>80**	**F**	**>80**	**F**
11.	16th Street / Owens Street	Signal	21	C	**>80**	**F**	**>80**	**F**	**>80**	**F**
12.	16th Street / Seventh Street / Mississippi Street	Signal	35	D	**>80**	**F**	**>80**	**F**	**>80**	**F**
13.	Mariposa Street / Terry A. Francois Blvd. / Illinois St.	AWSC	10 (SB)	B	19 (WB)	C	**>50 (NB)**	**F**	**>50 (NB)**	**F**
14.	Mariposa Street / Third Street	Signal	26	C	28	C	46	D	42	D
15.	Mariposa Street / I-280 NB Off-Ramp	Signal	23	C	41	D	43	D	43	D
16.	Mariposa Street / I-280 SB On-Ramp	***SSSC/Signal***	**>50 (EB)**	**F**	20	B	29	C	31	C
17.	18th Street / I-280 Northbound On-Ramp	SSSC	1 (EB)	A	1 (EB)	A	1 (EB)	A	1 (EB)	A
18.	18th Street / I-280 Southbound Off-Ramp	SSSC	13 (SB)	B	14 (SB)	B	23 (SB)	C	20 (SB)	C
19.	18th Street / Texas Street	SSSC	16 (SB)	C	16 (SB)	C	17 (SB)	C	17 (SB)	C
20.	18th Street / Arkansas Street	AWSC	8 (SB)	A	8 (SB)	A	8 (WB)	A	8 (WB)	A
21.	19th Street / Illinois Street	***SSSC/Signal***	10 (EB)	B	12	B	30	C	52	D

TABLE 43: WEEKDAY PM PEAK HOUR INTERSECTION LEVELS OF SERVICE - BASELINE PLUS PROJECT

Intersection		Traffic Control	Existing		Baseline[1]		Baseline Plus Project – Residential		Baseline Plus Project – Commercial	
			Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]
22.	20th Street / Illinois Street	AWSC	9 (NB)	A	16 (WB)	C	**>50 (NB)**	**F**	**>50 (WB)**	**F**
23.	20th Street / Third Street	Signal	13	B	16	B	**>80**	**F**	**>80**	**F**
24.	21st Street / Illinois Street (future)	SSSC	-	-	-	-	**>50 (WB)**	**F**	**>50 (WB)**	**F**
25.	22nd Street / Illinois Street	AWSC	9 (NB)	A	9 (SB)	A	**>50 (SB)**	**F**	**>50 (SB)**	**F**
26.	22nd Street / Third Street	Signal	9	A	20	B	**>80**	**F**	**>80**	**F**
27.	22nd Street / Tennessee Street	SSSC	12 (SB)	B	12 (SB)	B	15 (SB)	C	15 (SB)	C
28.	22nd Street / Indiana Street	AWSC	8 (WB)	A	8 (WB)	A	10 (WB)	B	10 (WB)	B
29.	23rd Street / Illinois Street	SSSC	12 (WB)	B	12 (WB)	B	**>50 (EB)**	**F**	**>50 (EB)**	**F**
30.	23rd Street / Third Street	Signal	11	B	15	B	**>80**	**F**	**>80**	**F**
31.	25th Street / Illinois Street	Signal	9	A	9	A	27	C	**65**	**E**
32.	25th Street / Third Street	Signal	13	B	15	B	**>80**	**F**	**>80**	**F**
33.	Cesar Chavez Street / Third Street	Signal	38	D	**>80**	**F**	**>80**	**F**	**>80**	**F**
34.	25th Street / Indiana Street / I-280 NB On-Ramp	AWSC	13 (WB)	B	15 (WB)	C	**>50 (WB)**	**F**	**>50 (WB)**	**F**
35.	25th Street / Pennsylvania Street	AWSC	31 (SB)	D	**48 (SB)**	**E**	**>50 (WB)**	**F**	**>50 (WB)**	**F**
36.	Pennsylvania Street / I-280 Southbound Off-Ramp	AWSC	18 (SB)	C	21 (SB)	C	**>50 (SB)**	**F**	**>50 (SB)**	**F**
37.	Pennsylvania Street / I-280 Southbound On-Ramp	SSSC	5 (SB)	A	5 (SB)	A	**>50 (SB)**	**F**	**>50 (SB)**	**F**
38.	Cesar Chavez Street / Pennsylvania St / I-280 NB Off	Signal	49	D	**61**	**E**	**>80**	**F**	**>80**	**F**

Notes: **Bold** indicates intersection operations at LOS E or LOS F. ***Bold and italics*** indicates traffic control type change. AWSC = all-way stop control. SSSC = side-street stop control.

1. Baseline condition is a modified existing condition.
2. Delay reported as seconds per vehicle.
3. LOS = Level of Service. For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000.

Source: Fehr & Peers, 2015

7.3.4.1 Maximum Residential Scenario

1. King Street / Third Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of King Street / Third Street operates at LOS D during the AM peak hour. The intersection would degrade from acceptable to unacceptable conditions (LOS E) during the AM peak hour with the Proposed Project. The intersection also operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 146 vehicle trips to the eastbound left-turn movement (a 14 percent contribution) and would add 250 vehicle trips to the northbound right-turn movement (a 47 percent contribution), which are critical movements under conditions without the Proposed Project.

Potential Measures Considered

To improve poor operating conditions at the intersection of King Street / Third Street, the SFMTA could modify the signal heads to allow for an overlap phase for the northbound (Third Street) right turn onto King Street such that northbound right turns are given a green arrow to turn simultaneously with the westbound left-turn movements. This potential measure would require prohibition of U-Turns from westbound King Street. With these improvements, the intersection would operate at LOS D in the AM peak hour and would improve from LOS F to LOS E during the PM peak hour. The improvement would result in acceptable operations under the AM peak hour and would improve operations during the PM peak hour to better than Baseline Conditions without the Proposed Project.

Potential Measure Feasibility

SFMTA believes that modified signal phasing is not a preferred measure at this intersection. The SFMTA has determined that the existing signal at King Street / Fifth Street / I-280 Ramps is not a desirable candidate for a longer cycle length. The signalized intersections along the King Street / Embarcadero corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians as well.

2. King Street / Fourth Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of King Street / Fourth Street operates at LOS E during the AM peak hour. The intersection would degrade to unacceptable conditions (LOS F) during the AM peak hour with the Proposed Project. The intersection operates under acceptable conditions in the PM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to

pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

3. King Street / Fifth Street / I-280 Ramps

Operations Analysis

Under Baseline Conditions, the signalized intersection of King Street / Fifth Street / I-280 Ramps operates at LOS D during the PM peak hour. The intersection would degrade from acceptable to unacceptable conditions (LOS E) during the PM peak hour with the Proposed Project. During the AM peak hour, the intersection operates unacceptably in both the Baseline Conditions and Baseline Plus Project (Maximum Residential Scenario) Conditions and the Proposed Project contributes less than 5 percent of the total vehicle volume at the intersection and the critical movements during this peak hour.

Potential Measures Considered

To improve poor operating conditions at the intersection, the City could adjust the signal cycle length increase from 110 seconds to 120 seconds in PM peak hour, with associated adjustments to green time splits. Implementation of this timing change would improve the intersection operations in the PM peak hour to acceptable LOS D conditions.

Potential Measure Feasibility

The SFMTA has determined that the existing signal at King Street / Fifth Street / I-280 Ramps is not a desirable candidate for a longer cycle length. The signalized intersections along the King Street / Embarcadero corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians as well.

4. Third Street / Harrison Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Harrison Street operates at LOS D during the PM peak hour. The Proposed Project (Maximum Residential Scenario) would cause the LOS at the intersection of Third Street and Harrison Street to degrade from acceptable to unacceptable conditions (LOS E) during the PM peak hour. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Potential Measures Considered

To improve poor operating conditions at the intersection of Third Street / Harrison Street, the SFMTA could increase the signal cycle length from 60 to 100 seconds in the PM peak hour, with associated adjustments to green time splits. If these timing changes were implemented, the intersection would improve to LOS D conditions in the PM peak hour.

Potential Measure Feasibility

The existing signal phasing at Third Street and Harrison Street is not a desirable candidate for a longer cycle length. This signal is coordinated with other signals along Third Street north of King Street, which means a broader study

of corridor-wide signal timing would need to be conducted prior to implementation. In addition, implementation of this potential measure would likely increase delay for pedestrians.

5. Third Street / Bryant Street

Operations Analysis

The signalized intersection of Third Street / Bryant Street operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 198 vehicle trips during the PM peak hour scenario to the northbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents a ten percent increase to the without Proposed Project movement volume during the PM peak hour. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

6. Sixth Street / Brannan Street / I-280 Ramps

Operations Analysis

The signalized intersection of Sixth Street / Brannan Street / I-280 Ramps operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 161 vehicle trips during the PM peak hour scenario to the southbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents an eleven percent increase to the without Proposed Project movement volume during the PM peak hour. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

7. Third Street / Terry A. Francois Boulevard

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Terry A. Francois Boulevard operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

8. Third Street / Channel Street

Opeations Analysis

The Proposed Project would cause the LOS at the intersection of Third Street / Channel Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measures Considered

A potential measure to reduce the impact is to increase the signal cycle length from 100 seconds to 120 seconds in AM peak hour, with associated adjustments to green time splits. Implementation of this timing change would improve the intersection operations in the AM peak hour to acceptable conditions. The cycle length increase would also improve operations in the PM peak hour, but it would not improve operations to acceptable conditions.

Potential Measure Feasibility

The SFMTA has determined that the existing signal at Third Street / Channel Street is not a desirable candidate for a longer cycle length. The signalized intersections along the Third Street corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians and transit vehicles, including the T Third line.

9. Third Street / Mission Rock Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Mission Rock Street operates at LOS D during the AM peak hour and LOS E during the PM peak hour. The Proposed Project (Maximum Residential Scenario) would cause the LOS at the intersection of Third Street and Mission Rock Street to degrade from acceptable to unacceptable conditions during the AM peak hour and from LOS E to LOS F during the PM peak hour.

Potential Measures Considered

To improve poor operating conditions at the intersection of Third Street / Mission Rock Street, the City could adjust the signal cycle length from 100 seconds to 120 seconds in AM peak hour and 130 seconds in PM peak hour, with associated adjustments to green time splits. If these timing changes were implemented, the intersection would improve to LOS D conditions in the AM and PM peak hours.

Potential Measure Feasibility

The SFMTA has determined that the existing signal at Third Street / Mission Rock Street is not a desirable candidate for a longer cycle length. The signalized intersections along the Third Street corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians and transit vehicles, including the T Third line.

10. 16th Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Third Street / 16th Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

11. 16th Street / Owens Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 16th Street / Owens Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection also operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 158 vehicle trips during the PM peak hour scenario to the westbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents a twenty-one percent increase to the without Proposed Project movement volume during the PM peak hour.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

12. 16th Street / Seventh Street / Mississippi Street

Operations Analysis

The intersection of 16th Street / Seventh Street / Mississippi Street operates at LOS F during the AM peak hour and the PM peak hour without the Proposed Project. The Proposed Project would add 150 vehicle trips to the eastbound through movement and would add 100 vehicle trips to the southbound left-turn movement during the AM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. These increases represent sixteen percent and thirty-five percent increase to the without Project movement volumes during the AM peak hour, respectively. The Proposed Project would add 125 vehicle trips to the westbound through movement and would add 18 vehicle trips to the northbound through movement during the PM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. This increase represents twenty percent and five percent increases to the without Proposed Project movement volumes during the PM peak hour, respectively.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Mariposa Street / Terry A. Francois Boulevard, / Illinois Street operates at LOS F during the AM peak hour and LOS C during the PM peak hour. The Proposed Project (Maximum Residential Scenario) would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). During the AM peak hour, the intersection remains at LOS F and contributes more than five percent of the volume to the worst approach. During both peak hours, the Caltrans peak hour volume signal warrant is met with the Proposed Project.

Potential Measures Considered

To improve poor operating conditions at the intersection of Mariposa Street / Terry A François Boulevard / Illinois Street, the SFMTA could decide to install a signal at this intersection. It should be noted that this intersection was signalized until recently, when the signals were removed in favor of all-way stop control due to deterioration of the signal. With signalization, this intersection would operate at LOS C in the AM and PM peak hours.

Potential Measure Feasibility

To improve poor operating conditions at the intersection of Mariposa Street / Terry A François Boulevard / Illinois Street, the intersection could be signalized. It should be noted that this intersection was signalized until recently, when the signals were removed in favor of all-way stop control due to deterioration of the signal. With signalization, this intersection would operate at LOS C in the AM and PM peak hours. Subsequent to completion of this analysis,

the City determined that this intersection will be signalized as part of the proposed Event Center / Mixed Use Development (Warriors arena).[32] Therefore, this Potential Measure will be completed by others.

14. Mariposa Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Mariposa Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection operates under acceptable conditions in the PM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

15. Mariposa Street / I-280 Northbound Off-Ramp

Operations Analysis

Under Baseline Conditions, the signalized intersection of Mariposa Street / I-280 Northbound Off-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

16. Mariposa Street / I-280 Southbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Mariposa Street / I-280 Southbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

[32] Mission Bay Blocks 29-32 Draft Subsequent EIR, pg 5.2-47

17. 18th Street / I-280 Northbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / I-280 Northbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

18. 18th Street / I-280 Southbound Off-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / I-280 Southbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

19. 18th Street / Texas Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / Texas Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

20. 18th Street / Arkansas Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / Arkansas Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

21. 19th Street / Illinois Street

Operatoins Analysis

Under Baseline Conditions, the signalized intersection of 19th Street / Illinois Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

22. 20th Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 20th Street would meet peak hour signal warrant criteria for signalization under the Proposed Project (Maximum Residential Scenario), and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measures Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate unacceptably in the AM and PM peak hours, though operations would be improved. It should be noted that the intersection of 20th Street / Illinois Street is currently signalized but operates with flashing red signal heads in all directions at all times (and thus operates as an all-way stop-controlled intersection).

To further improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-9 (RES)**. The Project Sponsor shall pay their fair share of the cost to install this potential measure. Overall, the Proposed Project contributes 27.7 percent of the total vehicle volume at this intersection during the AM peak hour and 33.3 percent during the PM peak hour.

23. 20th Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 20th Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

24. 21st Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 21st Street would meet peak hour signal warrant criteria for signalization under the Maximum Residential Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measures Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate unacceptably in the AM and PM peak hours, though operations would be improved.

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-10 (RES)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 84.9 percent of the total vehicle volume at this intersection during the AM peak hour and 85.0 percent during the PM peak hour.

25. 22nd Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 22nd Street would meet peak hour signal warrant criteria for signalization under the Maximum Residential Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measures Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate at LOS F in the AM and PM peak hours, though operations would be improved.

To further improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-11 (RES)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 83.1 percent of the total vehicle volume at this intersection during the AM peak hour and 82.8 percent during the PM peak hour.

26. 22nd Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 22nd Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

27. 22nd Street / Tennessee Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 22nd Street / Tennessee Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

28. 22nd Street / Indiana Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 22nd Street / Indiana Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

29. 23rd Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 23rd Street would meet peak hour signal warrant criteria for signalization under the Maximum Residential Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measures Considered and Feasibility

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS C or better during both peak hours. SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. However, SFMTA has also indicated that this intersection will likely be signalized as part of the proposed NRG Energy Potrero Plan project and thus, the Proposed Project would not be required to participate.

30. 23rd Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 23rd Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

31. 25th Street / Illinois Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of 25th Street / Illinois Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

32. 25th Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 25th Street / Third Street to degrade from acceptable to unacceptable conditions during the PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during the AM peak hour.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

33. Cesar Chavez Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Cesar Chavez Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection also operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 495 vehicle trips to the eastbound left-turn movement and would add 74 vehicle trips to the southbound through movement during the PM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. These increases represent one hundred sixty-two percent and twelve percent increase to the without Proposed Project movement volumes during the PM peak hour, respectively.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

34. 25th Street / Indiana Street / I-280 Northbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Indian Street / I-280 Northbound On-Ramp / 25th Street operates at LOS C during the PM peak hour. The Proposed Project (Maximum Residential Scenario) would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). The Caltrans peak hour volume signal warrant would be met with the Proposed Project. The intersection operates

under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Potential Measures Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B or better during both peak hours.

Potential Measure Feasibility

SFMTA and Caltrans believe that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-12 (RES)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 37.9 percent of the total vehicle volume at this intersection during the PM peak hour.

35. 25th Street / Pennsylvania Street

Operations Analysis

The unsignalized intersection of Pennsylvania Street / 25th Street would meet peak hour signal warrant criteria for signalization under the Maximum Residential Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions in the AM peak hour and contribute considerably to unacceptable operations in the PM peak hour.

Potential Measures Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would improve to acceptable LOS B in the AM peak hour. However, the intersection would still operate at LOS F in the PM peak hour.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-13 (RES)**. The SFMTA has commented that approval for signalization of this intersection would be subject to appropriate design accommodations for the Woods Division facility to the northeast of this location.

The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 32.8 percent of the total vehicle volume at this intersection during the AM peak hour and 33.2 percent during the PM peak hour.

36. Pennsylvania Street / I-280 Southbound Off-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Pennsylvania Street / I-280 Southbound off-ramp operates at LOS C during the PM peak hour. The Proposed Project under the Maximum Residential Scenario would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). The Caltrans peak hour volume signal warrant would be met with the Proposed Project. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Potential Measures Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B in the PM peak hour.

Potential Measure Feasibility

SFMTA and Caltrans believe that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-14 (RES)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 34.2 percent of the total vehicle volume at this intersection during the PM peak hour.

37. Pennsylvania Street / I-280 Southbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Pennsylvania Street / I-280 Southbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. With the Proposed Project, the intersection does degrade to unacceptable conditions in the PM peak hour; however, the intersection does not meet peak hour signal warrant criteria for signalization under any scenario and was not considered for potential measures.

38. Cesar Chavez Street / Pennsylvania Street / I-280 NB Off-Ramp

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Cesar Chavez Street / Pennsylvania Street / I-280 Northbound Off-Ramp to degrade from acceptable to unacceptable conditions during the PM peak hour. The intersection also operates at LOS F during the AM peak hour without the Proposed Project. The Proposed Project would add 28 vehicle trips to the eastbound left-turn movement and 567 vehicle trips to the northbound right-turn movement during the AM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. These increases represent eleven percent and eighty-four percent increases to the without Proposed Project movement volumes during the AM peak hour, respectively.

Potential Measures Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

7.3.4.2 Maximum Commercial Scenario

1. King Street / Third Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of King Street / Third Street operates at LOS D during the AM peak hour. The intersection would degrade from acceptable to unacceptable conditions (LOS E) during the AM peak hour with the Proposed Project. The intersection also operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 176 vehicle trips to the eastbound left-turn movement (a 16 percent contribution) and would add 301 vehicle trips to the northbound right-turn movement (a 51 percent contribution), which are critical movements under conditions without the Proposed Project.

Potential Measure Considered

To improve poor operating conditions at the intersection of King Street / Third Street, the SFMTA could modify the signal heads to allow for an overlap phase for the northbound (Third Street) right turn onto King Street such that northbound right turns are given a green arrow to turn simultaneously with the westbound left-turn movements. This potential measure would require prohibition of U-Turns from westbound King Street. With these improvements, the intersection would operate at LOS D in the AM peak hour and would improve from LOS F to LOS E during the PM peak hour. The improvement would result in acceptable operations under the AM peak hour and would improve operations during the PM peak hour to better than Baseline Conditions without the Proposed Project.

Potential Measure Feasibility

SFMTA believes that modified signal phasing is not a desireable measure at this intersection. The SFMTA has determined that the existing signal at King Street / Fifth Street / I-280 Ramps is not a desirable candidate for a longer cycle length. The signalized intersections along the King Street / Embarcadero corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians as well.

2. King Street / Fourth Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of King Street / Fourth Street operates at LOS E during the AM peak hour. The intersection would degrade to unacceptable conditions (LOS F) during the AM peak hour with the Proposed Project. The intersection operates under acceptable conditions in the PM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

3. King Street / Fifth Street / I-280 Ramps

Operations Analysis

Under Baseline Conditions, the signalized intersection of King Street / Fifth Street / I-280 Ramps operates at LOS D during the PM peak hour. The intersection would degrade from acceptable to unacceptable conditions (LOS E) during the PM peak hour with the Proposed Project. During the AM peak hour, the intersection operates unacceptably in both the Baseline Conditions and Baseline Plus Project (Maximum Commercial Scenario) Conditions and the Proposed Project contributes less than 5 percent of the total vehicle volume at the intersection and the critical movements during this peak hour.

Potential Measure Considered

To improve poor operating conditions at the intersection, the City could adjust the signal cycle length increase from 110 seconds to 130 seconds in PM peak hour, with associated adjustments to green time splits. Implementation of this timing change would improve the intersection operations in the PM peak hour to acceptable LOS D conditions.

Potential Measure Feasibility

The SFMTA has determined that the existing signal at King Street / Fifth Street / I-280 Ramps is not a desirable candidate for a longer cycle length. The signalized intersections along the King Street / Embarcadero corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians as well.

4. Third Street / Harrison Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Harrison Street operates at LOS D during the PM peak hour. The Proposed Project (Maximum Commercial Scenario) would cause the LOS at the intersection of Third Street and Harrison Street to degrade from acceptable to unacceptable conditions (LOS E) during the PM peak hour. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Potential Measure Considered

To improve poor operating conditions at the intersection of Third Street / Harrison Street, the SFMTA could increase the signal cycle length from 60 to 100 seconds in the PM peak hour, with associated adjustments to green time splits. If these timing changes were implemented, the intersection would improve to LOS D conditions in the PM peak hour.

Potential Measure Feasibility

The existing signal phasing at Third Street and Harrison Street is not a desirable candidate for a longer cycle length. This signal is coordinated with other signals along Third Street north of King Street, which means a broader study of corridor-wide signal timing would need to be conducted prior to implementation. In addition, implementation of this potential measure would likely increase delay for pedestrians.

5. Third Street / Bryant Street

Operations Analysis

The signalized intersection of Third Street / Bryant Street operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 232 vehicle trips during the PM peak hour scenario to the northbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents an eleven percent increase to the without Proposed Project movement volume during the PM peak hour. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

6. Sixth Street / Brannan Street / I-280 Ramps

Operations Analysis

The signalized intersection of Sixth Street / Brannan Street / I-280 Ramps operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 126 vehicle trips during the PM peak hour scenario to the southbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents a nine percent increase to the without Proposed Project movement volume during the PM peak hour. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

7. Third Street / Terry A. Francois Boulevard

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Terry A. Francois Boulevard operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

8. Third Street / Channel Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Third Street / Channel Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measure Considered

A potential measure to reduce the impact is to increase the signal cycle length from 100 seconds to 120 seconds in AM peak hour, with associated adjustments to green time splits. Implementation of this timing change would improve the intersection operations in the AM peak hour to acceptable conditions. The cycle length increase would also improve operations in the PM peak hour, but it would not improve operations to acceptable conditions.

Potential Measure Feasibility

The SFMTA has determined that the existing signal at Third Street / Channel Street is not a desirable candidate for a longer cycle length. The signalized intersections along the Third Street corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians and transit vehicles, including the T Third line.

9. Third Street / Mission Rock Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Mission Rock Street operates at LOS D during the AM peak hour and LOS E during the PM peak hour. The Proposed Project (Maximum Commercial Scenario) would cause the LOS at the intersection of Third Street and Mission Rock Street to degrade from acceptable to unacceptable conditions during the AM peak hour and from LOS E to LOS F during the PM peak hour.

Potential Measure Considered

To improve poor operating conditions at the intersection of Third Street / Mission Rock Street, the City could adjust the signal cycle length from 100 seconds to 140 seconds in AM and PM peak hours, with associated adjustments to green time splits. Implementation of this timing change would improve the intersection operations in the AM peak hour to acceptable conditions. The cycle length increase would also improve operations in the PM peak hour, but it would not improve operations to acceptable conditions.

Potential Measure Feasibility

The SFMTA has determined that the existing signal at Third Street / Mission Rock Street is not a desirable candidate for a longer cycle length. The signalized intersections along the Third Street corridor are coordinated; changing the cycle length for just one intersection would have corridor-wide impacts on traffic conditions. Implementation of this potential measure would likely increase delay for pedestrians and transit vehicles, including the T Third line.

10. 16th Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Third Street / 16th Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

11. 16th Street / Owens Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 16th Street / Owens Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection also operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 183 vehicle trips during the PM peak hour scenario to the westbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents a twenty-five percent increase to the without Proposed Project movement volume during the PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to

pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

12. 16th Street / Seventh Street / Mississippi Street

Operations Analysis

The intersection of 16th Street / Seventh Street / Mississippi Street operates at LOS F during the AM peak hour and the PM peak hour without the Proposed Project. The Proposed Project would add 175 vehicle trips to the eastbound through movement and would add 128 vehicle trips to the southbound left-turn movement during the AM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. These increases represent nineteen percent and forty-five percent increases to the without Proposed Project movement volumes during the AM peak hour, respectively. The Proposed Project would add 143 vehicle trips to the westbound through movement and would add 21 vehicle trips to the northbound through movement during the PM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. These increases represent twenty-three percent and six percent increases to the without Proposed Project movement volumes during the PM peak hour, respectively.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Mariposa Street / Terry A. Francois Boulevard, / Illinois Street operates at LOS F during the AM peak hour and LOS C during the PM peak hour. The Proposed Project (Maximum Commercial Scenario) would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). During the AM peak hour, the intersection remains at LOS F and contributes more than five percent of the volume to the worst approach. During both peak hours, the Caltrans peak hour volume signal warrant is met with the Proposed Project.

Potential Measure Considered and Feasibility

To improve poor operating conditions at the intersection of Mariposa Street / Terry A François Boulevard / Illinois Street, the SFMTA could decide to install a signal at this intersection. It should be noted that this intersection was signalized until recently, when the signals were removed in favor of all-way stop control due to deterioration of the

signal. With signalization, this intersection would operate at LOS C in the AM and PM peak hours.This intersection will be signalized as part of the proposed Event Center / Mixed Use Development (Warriors arena).[33]

14. Mariposa Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Mariposa Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection operates under acceptable conditions in the PM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

15. Mariposa Street / I-280 Northbound Off-Ramp

Operations Analysis

Under Baseline Conditions, the signalized intersection of Mariposa Street / I-280 Northbound Off-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

16. Mariposa Street / I-280 Southbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Mariposa Street / I-280 Southbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

17. 18th Street / I-280 Northbound On-Ramp

[33] Mission Bay Blocks 29-32 Draft Subsequent EIR, pg 5.2-47

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / I-280 Northbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

18. 18th Street / I-280 Southbound Off-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / I-280 Southbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

19. 18th Street / Texas Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / Texas Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

20. 18th Street / Arkansas Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 18th Street / Arkansas Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

21. 19th Street / Illinois Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of 19th Street / Illinois Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

22. 20th Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 20th Street would meet peak hour signal warrant criteria for signalization under the Proposed Project (Maximum Commercial Scenario), and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate unacceptably in the AM and PM peak hours, though operations would be improved. It should be noted that the intersection of 20th Street / Illinois Street is currently signalized but operates with flashing red signal heads in all directions at all times (and thus operates as an all-way stop-controlled intersection).

To further improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-9 (COM)**. The Project Sponsor shall pay their fair share of the cost to install this potential measure. Overall, the Proposed Project contributes 68.0 percent of the total vehicle volume at this intersection during the AM peak hour and 66.7 percent during the PM peak hour.

23. 20th Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 20th Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

24. 21st Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 21st Street would meet peak hour signal warrant criteria for signalization under the Maximum Commercial Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate at LOS F in the AM and PM peak hours, though operations would be improved.

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-10 (COM)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 86.0 percent of the total vehicle volume at this intersection during the AM peak hour and 84.6 percent during the PM peak hour.

25. 22nd Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 22nd Street would meet peak hour signal warrant criteria for signalization under the Maximum Commercial Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate at LOS F in the AM and PM peak hours, though operations would be improved.

To further improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and

pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-11 (COM)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 84.2 percent of the total vehicle volume at this intersection during the AM peak hour and 82.6 percent during the PM peak hour.

26. 22nd Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 22nd Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

27. 22nd Street / Tennessee Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 22nd Street / Tennessee Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

28. 22nd Street / Indiana Street

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of 22nd Street / Indiana Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

29. 23rd Street / Illinois Street

Operations Analysis

The unsignalized intersection of Illinois Street / 23rd Street would meet peak hour signal warrant criteria for signalization under the Maximum Commercial Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions.

Potential Measure Feasibility

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS C or better during both peak hours. SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. However, SFMTA has also indicated that this intersection will likely be signalized as part of the proposed NRG Energy Potrero Plan project and thus, the Proposed Project would not be required to participate.

30. 23rd Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 23rd Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour and PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

31. 25th Street / Illinois Street

Impact Analysis

The Proposed Project would cause the LOS at the intersection of 25th Street / Illinois Street to degrade from acceptable to unacceptable conditions during the PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during the AM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

32. 25th Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 25th Street / Third Street to degrade from acceptable to unacceptable conditions during the PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during the AM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

33. Cesar Chavez Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Cesar Chavez Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection also operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 401 vehicle trips to the eastbound left-turn movement and would add 87 vehicle trips to the southbound through movement during the PM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. These increases represent one hundred thirty-one percent and fourteen percent increases to the without Proposed Project movement volumes during the PM peak hour, respectively.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

34. 25th Street / Indiana Street / I-280 Northbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Indian Street / I-280 Northbound On-Ramp / 25th Street operates at LOS C during the PM peak hour. The Proposed Project (Maximum Commercial Scenario) would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). The Caltrans peak hour volume signal warrant would be met with the Proposed Project. The intersection operates

under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B or better during both peak hours.

Potential Measure Feasibility

SFMTA and Caltrans believe that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-12 (COM)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 37.9 percent of the total vehicle volume at this intersection during the PM peak hour.

35. 25th Street / Pennsylvania Street

Operations Analysis

The unsignalized intersection of Pennsylvania Street / 25th Street would meet peak hour signal warrant criteria for signalization under the Maximum Commercial Scenario, and the Proposed Project traffic would cause the intersection to deteriorate from acceptable to unacceptable conditions in the AM peak hour and contribute considerably to unacceptable operations in the PM peak hour.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would improve to acceptable LOS B in the AM peak hour. However, the intersection would still operate at LOS F in the PM peak hour.

Potential Measure Feasibility

SFMTA believes that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-13 (COM)**. The SFMTA has commented that approval for signalization of this intersection would be subject to appropriate design accommodations for the Woods Division facility to the northeast of this location.

The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 32.9 percent of the total vehicle volume at this intersection during the AM peak hour and 33.8 percent during the PM peak hour.

36. Pennsylvania Street / I-280 Southbound Off-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Pennsylvania Street / I-280 Southbound off-ramp operates at LOS C during the PM peak hour. The Proposed Project under the Maximum Commercial Scenario would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). The Caltrans peak hour volume signal warrant would be met with the Proposed Project. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B in the PM peak hour.

Potential Measure Feasibility

SFMTA and Caltrans believe that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-14 (COM)**. The SMFTA cannot commit that sufficient funding is available to ensure that this measure would be implemented, although they can potentially pursue additional funds to fill a funding gap, depending on other signalization needs. The Project Sponsor shall pay their fair share of the cost for this potential measure, as determined in the proposed measures threshold and monitoring plan in Appendix G. Overall, the Proposed Project contributes 33.5 percent of the total vehicle volume at this intersection during the PM peak hour.

37. Pennsylvania Street / I-280 Southbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Pennsylvania Street / I-280 Southbound On-Ramp operates at an acceptable level of service during both the AM and PM peak hour. With the Proposed Project, the intersection does degrade to unacceptable conditions in the PM peak hour; however, the intersection does not meet peak hour signal warrant criteria for signalization under any scenario and was not considered for potential measures.

38. Cesar Chavez Street / Pennsylvania Street / I-280 NB Off-Ramp

Operations Analysis

The Proposed Project would cause the LOS at the intersection of Cesar Chavez Street / Pennsylvania Street / I-280 Northbound Off-Ramp to degrade from acceptable to unacceptable conditions during the PM peak hour. The intersection also operates at LOS F during the AM peak hour without the Proposed Project. The Proposed Project would add 36 vehicle trips to the eastbound left-turn movement and would add 723 vehicle trips to the northbound right-turn movement during the AM peak hour scenario, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project. These increases represent fifteen percent and one hundred-eight percent increases to the without Proposed Project movement volumes during the AM peak hour, respectively.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

Table 44 shows a summary of the intersection analysis results for both scenarios. Under the previous impact criteria, the Maximum Commercial Scenario would have significantly impacted one more intersection overall. The two scenarios would have significantly impacted the same the number of intersections during the AM peak hour (and 18 of the 19 locations are the same), and the Maximum Commercial Scenario would significantly impact one additional intersection in the PM peak hour (with all 25 of the overlapping intersections having a significant impact in both scenarios).

TABLE 44: BASELINE PLUS PROJECT ANALYSIS SUMMARY

Intersection	AM Peak Hour		PM Peak Hour	
	Baseline Plus Project – Residential	Baseline Plus Project – Commercial	Baseline Plus Project – Residential	Baseline Plus Project – Commercial
1. King Street / Third Street	X	X	X	X
2. King Street / Fourth Street	X	X		
3. King Street / Fifth Street / I-280 Ramps			X	X
4. Third Street / Harrison Street			X	X
5. Third Street / Bryant Street			X	X
6. Sixth Street / Brannan Street / I-280 Ramps			X	X
7. Third Street / Terry A. Francois Boulevard				
8. Third Street / Channel Street	X	X	X	X
9. Third Street / Mission Rock Street	X	X	X	X
10. 16th Street / Third Street	X	X	X	X
11. 16th Street / Owens Street	X	X	X	X
12. 16th Street / Seventh Street / Mississippi Street	X	X	X	X
13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.				
14. Mariposa Street / Third Street	X	X		
15. Mariposa Street / I-280 NB Off-Ramp				
16. Mariposa Street / I-280 SB On-Ramp				

TABLE 44: BASELINE PLUS PROJECT ANALYSIS SUMMARY				
Intersection	AM Peak Hour		PM Peak Hour	
	Baseline Plus Project – Residential	Baseline Plus Project – Commercial	Baseline Plus Project – Residential	Baseline Plus Project – Commercial
17. 18th Street / I-280 Northbound On-Ramp				
18. 18th Street / I-280 Southbound Off-Ramp				
19. 18th Street / Texas Street				
20. 18th Street / Arkansas Street				
21. 19th Street / Illinois Street				
22. 20th Street / Illinois Street	TR-9	TR-9	TR-9	TR-9
23. 20th Street / Third Street	X	X	X	X
24. 21st Street / Illinois Street (future)	TR-10	TR-10	TR-10	TR-10
25. 22nd Street / Illinois Street	TR-11	TR-11	TR-11	TR-11
26. 22nd Street / Third Street	X	X	X	X
27. 22nd Street / Tennessee Street				
28. 22nd Street / Indiana Street				
29. 23rd Street / Illinois Street				
30. 23rd Street / Third Street	X	X	X	X
31. 25th Street / Illinois Street				X
32. 25th Street / Third Street		X	X	X
33. Cesar Chavez Street / Third Street	X	X	X	X
34. 25th Street / Indiana Street / I-280 NB On-Ramp			TR-12	TR-13
35. 25th Street / Pennsylvania Street	TR-13	TR-13	TR-13	TR-13
36. Pennsylvania Street / I-280 Southbound Off-Ramp			TR-14	TR-14
37. Pennsylvania Street / I-280 Southbound On-Ramp				
38. Cesar Chavez Street / Pennsylvania St / I-280 NB Off	X	X	X	X

Notes: X indicates intersection with congestion that would exceed prior thresholds for acceptable operations but with no feasible potential measure. Blank cell indicates that no potential measures were necessary. TR-X indicates potential measures were found and improve operations to acceptable levels. TR-X indicates potential measures were found and did not improve operations to acceptable levels. Baseline condition is a modified existing condition.

Source: Fehr & Peers, 2015.

7.3.5 Freeway Analysis

Similar to intersections, Proposed Project trips would be added to existing traffic volumes at study freeway segments to create Baseline Plus Project traffic volumes. **Table 45** compares the LOS under Baseline and Baseline Plus Project conditions in the AM peak hour, and **Table 46** compares the LOS under Baseline and Baseline Plus Project conditions in the PM peak hour. Detailed analysis results are presented in Appendix L.

The **I-280 northbound on-ramp at Indiana Street / 25th Street** merge freeway segment operates at LOS F during the AM peak hour both with and without the Proposed Project, though the Proposed Project contributes between three and four percent to the freeway merge segment volume. The **I-280 southbound on-ramp at Mariposa Street** merge freeway segment operates at LOS F during the PM peak hour both with and without the Proposed Project, though the Proposed Project contributes between two and three percent to the freeway merge segment volume. Because the Proposed Project would contribute less than five percent of the total freeway volume to these segments operating unacceptably, the Proposed Project's impact on these segments would have been considered less than significant.

The Proposed Project would have had a significant impact on four freeway segments (impacts were the same for both the Maximum Residential Scenario and the Maximum Commercial Scenario in all but one case):

- The **I-280 northbound off-ramp at Mariposa Street** diverge freeway segment operates at LOS F during the AM peak hour both with and without the Proposed Project. The Proposed Project adds 275 and 300 vehicle trips with the Maximum Residential and Maximum Commercial Scenarios, respectively, to this diverge segment during the AM peak hour. This contribution is approximately six percent of the freeway volume. Because the Proposed Project would contribute more than five percent of traffic to this freeway segment operating at LOS F during the AM peak hour, the Proposed Project's impact on this segment would have been considered significant for both the Maximum Residential and Maximum Commercial Scenarios.

- The **I-280 northbound off-ramp at Pennsylvania Street / Cesar Chavez Street** diverge freeway segment operates at LOS E during the AM peak hour and LOS D during the PM peak hour without the Proposed Project. With the Proposed Project, the off-ramp would operate at LOS F in the AM peak hour and LOS E in the PM peak hour for the Maximum Residential Scenario. Because the Proposed Project would cause the LOS to deteriorate from LOS E to LOS F in the AM peak hour and LOS D to LOS E in the PM peak hour, the Proposed Project's impact at this location would have been considered significant under the Maximum Residential Scenario.

  With the Maximum Commercial Scenario, the Proposed Project would continue to deteriorate the segment LOS from LOS E to LOS F in the AM peak hour. The segment would continue to operate acceptably at LOS D during the PM peak hour. Because the Proposed Project would deteriorate this segment's LOS from LOS E to LOS F in the AM peak hour, the Proposed Project's impacts would have been considered significant under the Maximum Commercial Scenario.

- The **I-280 southbound on-ramp at Sixth Street** merge freeway segment operates at LOS F during the PM peak hour both with and without the Proposed Project. The Proposed Project adds 193 and 248 vehicle trips with the Maximum Commercial and Maximum Residential Scenarios, respectively, to this weave segment during the PM peak hour. This represents a contribution of approximately five to six percent of the freeway volume. Because the Proposed Project would contribute more than five percent of traffic to this freeway segment operating at LOS F during the PM peak hour, the Proposed Project's impact on this segment would have been considered significant for both the Maximum Residential and Maximum Commercial Scenarios.

- The **I-280 southbound on-ramp at Pennsylvania Street / 25th Street** merge freeway segment operates at LOS E during the PM peak hour without the Proposed Project. With the Proposed Project, the off-ramp would operate at LOS F during the PM peak hour under both the Maximum Commercial and Maximum Residential scenarios. Because the Proposed Project would deteriorate the LOS from LOS E to LOS F on this

segment, the Proposed Project's impacts would have been considered significant in both the Maximum Commercial and Maximum Residential scenarios.

No feasible potential measures are available for the freeway ramp impacts because there is insufficient physical space for additional capacity without redesign of the I-280 ramp and mainline structures, which may require acquisition of additional right-of-way. Other potential measures to improve operations would involve reducing the traffic volumes entering the weaving section, either through ramp metering, tolling, or other means. Ramp metering, however, could exacerbate congestion on streets leading to the on-ramp (though ramp metering has also been implemented without such impacts), while tolling would need to be implemented as a system-wide improvement in order to prevent concentration of vehicular traffic and increased congestion on non-tolled facilities. Moreover, any changes to the ramps would require approval of Caltrans, which operates the freeways and ramps, and therefore such improvements are outside the jurisdiction and control of the City as lead agency.

TABLE 45: AM PEAK HOUR FREEWAY LEVELS OF SERVICE – BASELINE PLUS PROJECT CONDITIONS

Freeway Segment	Facility Type	Existing		Baseline[1]		Baseline Plus Project – Residential		Baseline Plus Project – Commercial	
		Density[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]
Northbound I-280									
Sixth Street off-ramp	Ramp Diverge	12	B	12	B	13	B	13	B
Mariposa Street off-ramp	Ramp Diverge	25	C	**-**	**F**	**-**	**F**	**-**	**F**
18th Street on-ramp	Ramp Merge	18	B	18	B	19	B	19	B
Indiana Street / 25th Street on-ramp	Ramp Merge	28	C	**-**	**F**	**-**	**F**	**-**	**F**
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	34	D	**41**	**E**	**-**	**F**	**-**	**F**
Southbound I-280									
Sixth Street on-ramp	Weave	1,234	C	1,240	C	1,358	D	1,392	D
Mariposa Street on-ramp	Ramp Merge	17	B	18	B	18	B	18	B
18th Street off-ramp	Ramp Diverge	14	B	14	B	16	B	17	B
Pennsylvania Street / 25th Street on-ramp	Ramp Merge	19	B	20	C	24	C	23	C
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	20	B	20	C	21	C	21	C

Notes:

1. Baseline condition is a modified existing condition.
2. Density of vehicles per segment. Measured in passenger cars per mile per lane (pc/mi/ln). Service volume shown for weaving segment. No density value is presented for diverge or merge segments where the demand volume exceeds the capacity, per *2000 Highway Capacity Manual*.
3. Segments operating at LOS E or LOS F conditions highlighted in **bold.**

Source: Fehr & Peers, 2015

TABLE 46: PM PEAK HOUR FREEWAY LEVELS OF SERVICE – BASELINE PLUS PROJECT CONDITIONS

Freeway Segment	Facility Type	Existing		Baseline[1]		Baseline Plus Project – Residential		Baseline Plus Project – Commercial	
		Density[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]
Northbound I-280									
Sixth Street off-ramp	Ramp Diverge	11	B	11	B	12	B	12	B
Mariposa Street off-ramp	Ramp Diverge	25	C	26	C	28	D	28	D
18th Street on-ramp	Ramp Merge	16	B	16	B	18	B	19	C
Indiana Street / 25th Street on-ramp	Ramp Merge	20	C	21	C	23	C	23	C
Pennsylvania Street / Cesar Chavez Street on-ramp	Ramp Merge	30	D	29	D	**36**	**E**	34	D
Southbound I-280									
Sixth Street on-ramp	Weave	**1,951**	**F**	**1,954**	**F**	**2,081**	**F**	**2,053**	**F**
Mariposa Street on-ramp	Ramp Merge	29	D	**-**	**F**	**-**	**F**	**-**	**F**
18th Street off-ramp	Ramp Diverge	22	C	22	C	24	C	23	C
Pennsylvania Street / 25th Street on-ramp	Ramp Merge	33	D	**38**	**E**	**-**	**F**	**-**	**F**
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	31	D	34	D	35	D	35	D

Notes:

1. Baseline condition is a modified existing condition.
2. Density of vehicles per segment. Measured in passenger cars per mile per lane (pc/mi/ln). Service volume shown for weaving segment. No density value is presented for diverge or merge segments where the demand volume exceeds the capacity, per *2000 Highway Capacity Manual*.
3. Segments operating at LOS E or LOS F conditions highlighted in **bold.**

Source: Fehr & Peers, 2015

7.3.6 Cumulative Traffic Analysis

Future year 2040 Cumulative traffic volumes were developed in order to assess the long-term cumulative effects of the Proposed Project in combination with projected development within San Francisco and the rest of the Bay Area, as well as implementation of planned transportation infrastructure projects. For the future year, Cumulative intersection traffic volumes were derived from outputs from the San Francisco County Transportation Authority's travel demand forecasting model (SF-CHAMP Model).

The SF-CHAMP model is an activity based travel demand model that has been validated to represent existing and future transportation conditions in San Francisco. The model predicts all person travels for a full day based on total and locations of population, housing units and employment, which are then allocated to different periods throughout the day, using time of day sub-models. The SF-CHAMP model predicts person travel by mode for auto, transit, walk and bicycle trips. The SF-CHAMP model also provides forecasts of vehicular traffic on regional freeways, major arterials and on the study area local roadway network considering the available roadway capacity, origin-destination demand and travel speeds when assigning the future travel demand to the roadway network.

SF-CHAMP divides San Francisco into 981 geographic areas, known as Traffic Analysis Zones (TAZs). It also includes zones outside of San Francisco, for which it uses the same geography as the current Metropolitan Transportation Commission (MTC) Model: "Travel Model One". For each TAZ, the model estimates the travel demand based on TAZ population and employment assumptions developed by the Association of Bay Area Governments (ABAG). Within San Francisco, the San Francisco Planning Department is responsible for allocating ABAG's countywide growth forecast to each TAZ for the future cumulative year model, based upon existing zoning and approved plans, using an area's potential zoning capacity, and the anticipated extent of redevelopment of existing uses. The current cumulative future year has been used consistently for recent large transportation studies in San Francisco.

Regional travel demand models such as SF-CHAMP are designed to be able to represent city-wide and regional trends and do not represent an intersection level of analysis commensurate with projecting specific turning movements. Instead, the SF-CHAMP model provides traffic volume outputs that can then be adjusted using professional judgment and methodology and then modeled in other traffic modeling software (such as Synchro), to represent intersection and turning movement operations. In addition to the application of a standard methodology, creating forecasts from model output involves engineering judgment, past experience, and knowledge of the transportation characteristics of the study area.

The model run accounts for some growth in the Proposed Project TAZ, which encompasses only Pier 70. However, as shown in **Table 47**, the amount of traffic growth forecasted by the model for the roadways surrounding the Proposed Project site is considerably less than the traffic growth projected to be generated by the Proposed Project. The original land use assumptions included in the SF-CHAMP model was of a smaller scale than the land use currently proposed by the Proposed Project. Based on the travel demand estimates provided in Chapter 4, the SF-CHAMP model includes just 62 to 66 percent of the projected growth in the AM peak hour and 69 percent of the Proposed Project growth in the PM peak hour.

Therefore, the modeled trips were manually removed from the TAZ to attain the Cumulative 2040 No Project volume forecasts. Proposed Project trips shown in **Figure 8** and **Figure 9** were then added to the Cumulative 2040 No Project forecasts to create Cumulative 2040 Plus Project intersection turning movement volumes, as shown in **Figure 15** (Maximum Residential Scenario) and **Figure 16** (Maximum Commercial Scenario).

TABLE 47: CUMULATIVE VEHICLE TRIP GENERATION COMPARISON							
TAZ[1]	Location	2040 CHAMP Output		Project Trips – Maximum Residential Scenario[2]		Project Trips – Maximum Commercial Scenario[2]	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
559	Pier 70	2,107	2,686	3,213	3,898	3,398	3,891

Notes:

1. Traffic analysis zone in SF-CHAMP travel demand model maintained by the SFCTA.
2. "*Pier 70 Mixed-Use District Project Estimation of Project Travel Demand," April 2015.*

Source: SFCTA; Adavant Consulting; Fehr & Peers, 2016

Table 48 and **Table 49** present the Cumulative 2040 Plus Project intersection levels of service for the weekday AM peak hour and PM peak hour for the Maximum Residential Scenario and the Maximum Commercial Scenario, respectively.

At locations where the Proposed Project was determined to have a Project-specific impact, the Proposed Project's contribution to cumulative impacts at these locations is also considered significant. Previously described mitigation measures are described as well. Under Cumulative Plus Project Conditions, 33 intersections are projected to operate at unacceptable LOS E or F.



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Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

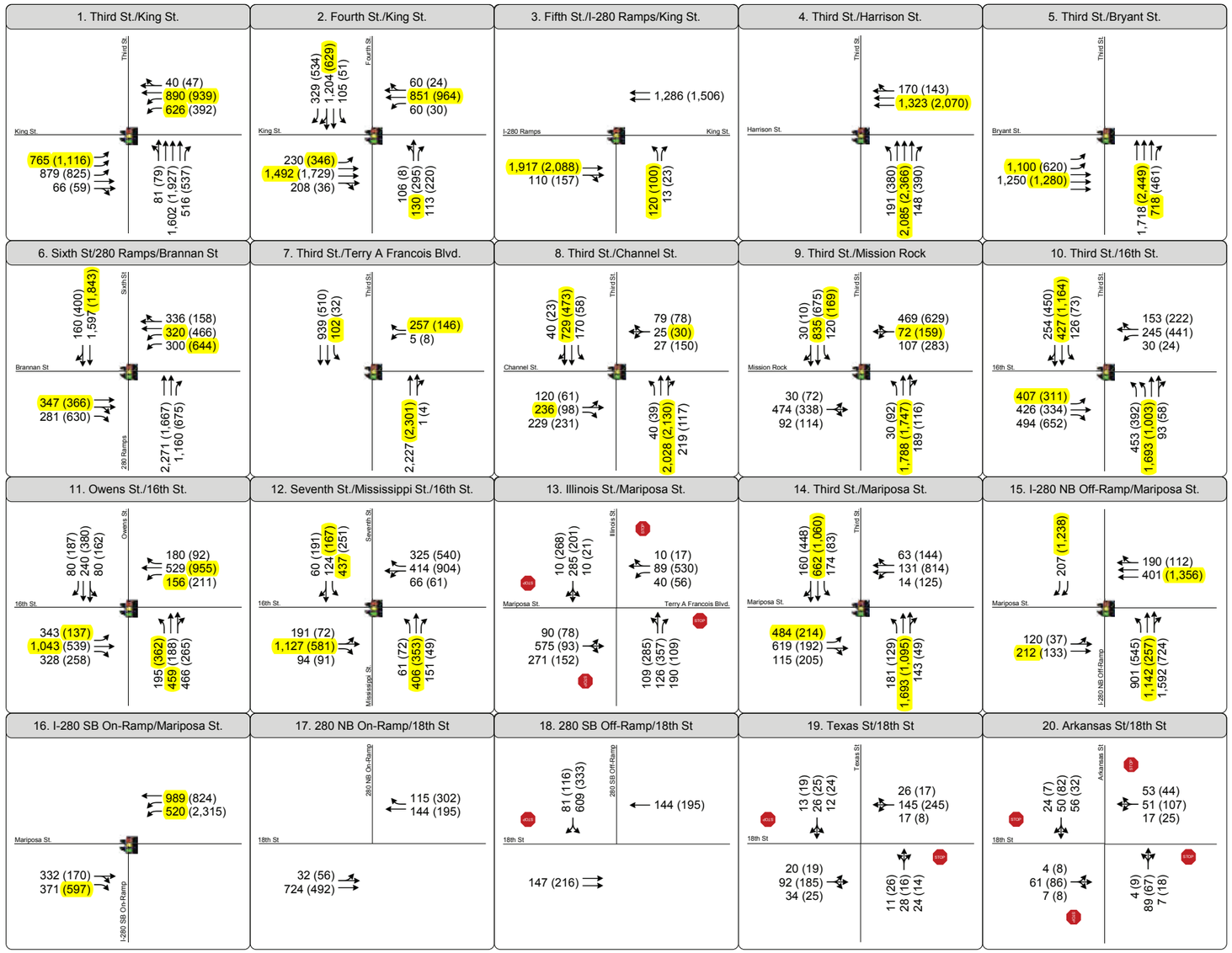
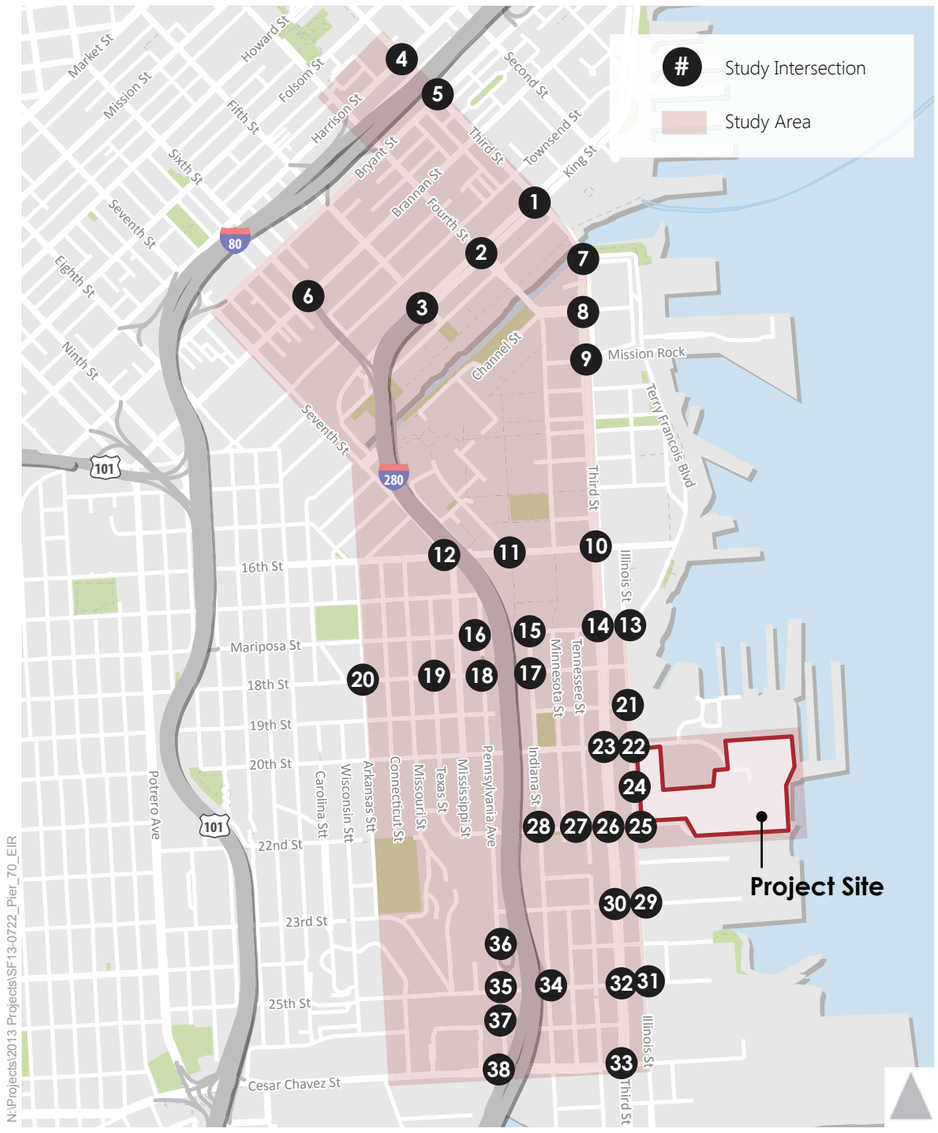
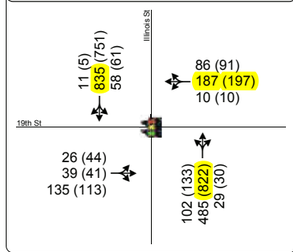


Figure 15A

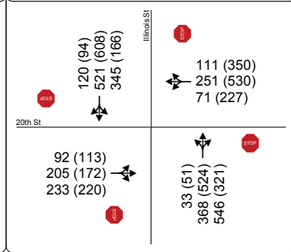
Cumulative Plus Project Peak Hour Traffic Volumes - Maximum Residential Scenario



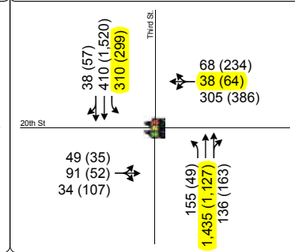
21. Illinois St/19th St



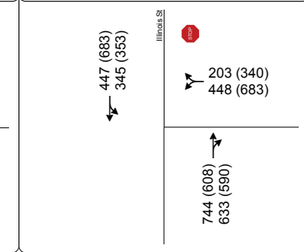
22. Illinois St/20th St



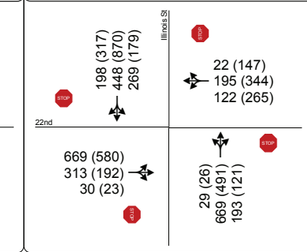
23. Third St./20th St



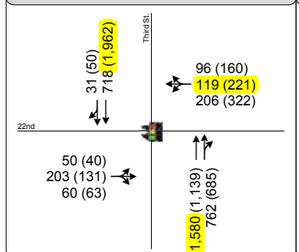
24. Illinois St/Future Driveway



25. Illinois St/22nd



26. Third St./22nd



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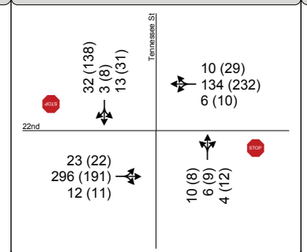

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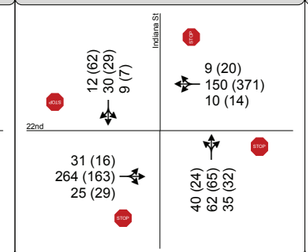

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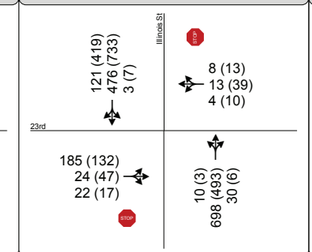

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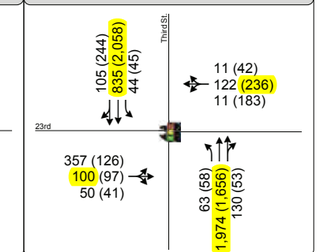
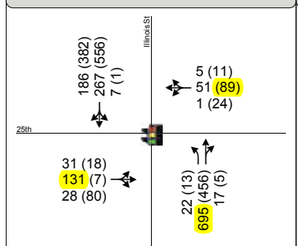


31. Illinois St/25th



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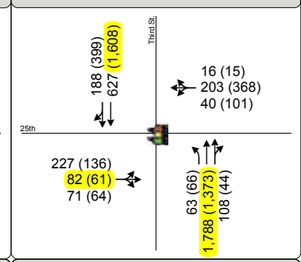
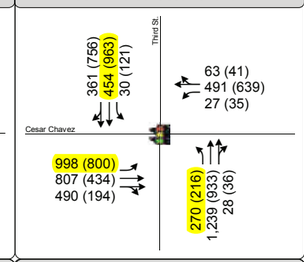
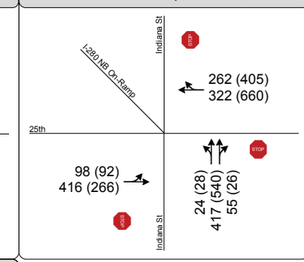


33. Third St./Cesar Chavez



34. 280 NB On-Ramp/Indiana St/25th



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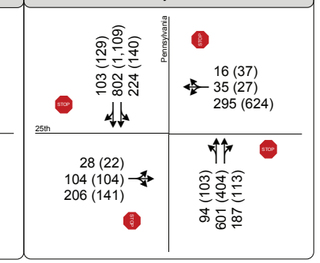

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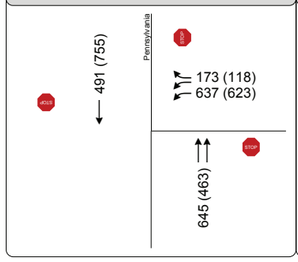

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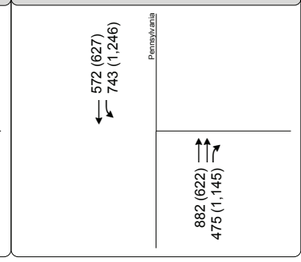
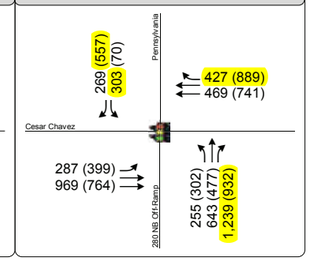


38. 280 NB Off-Ramp/Cesar Chavez



Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

Figure 15B

Cumulative Plus Project Peak Hour Traffic Volumes - Maximum Residential Scenario



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Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

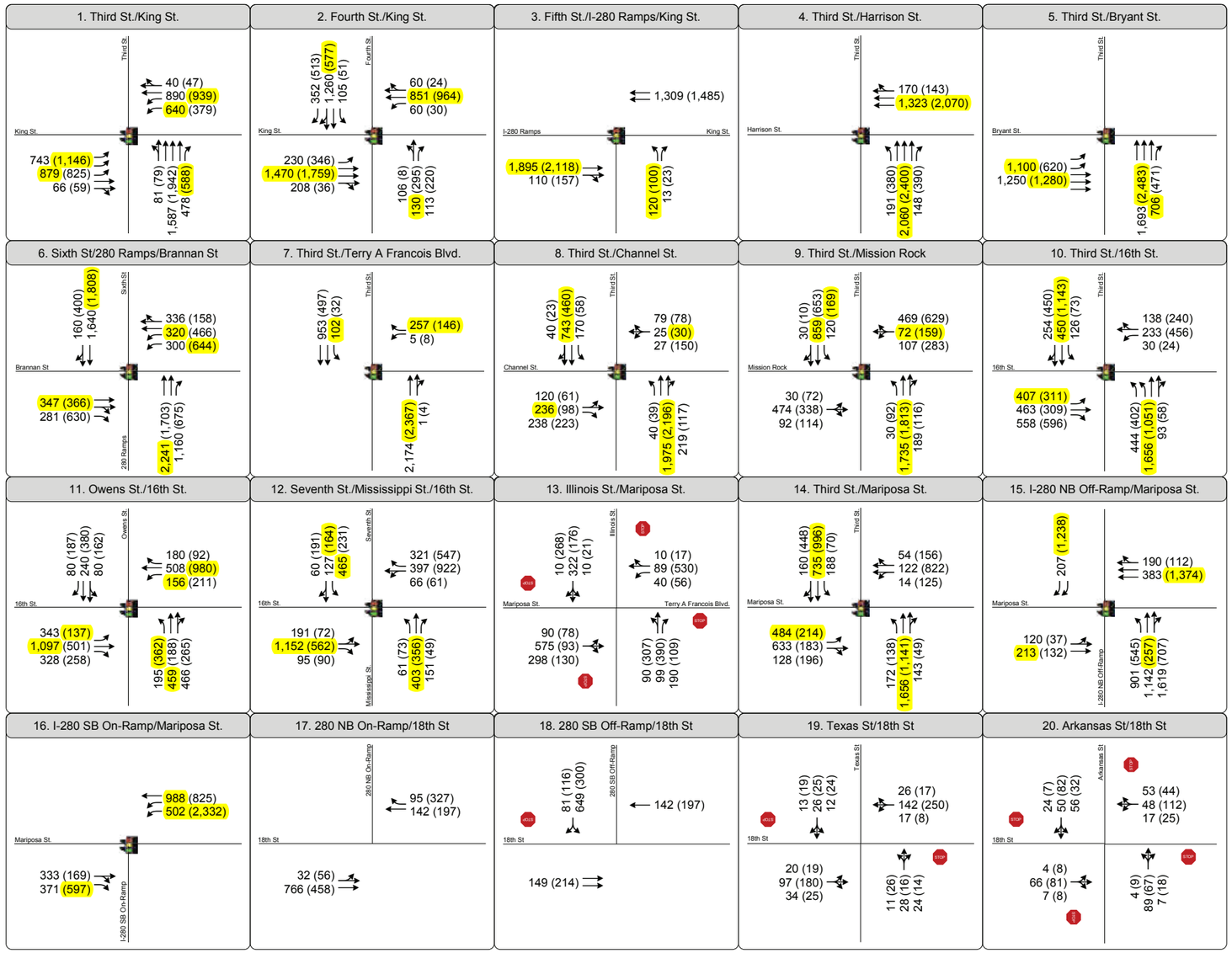
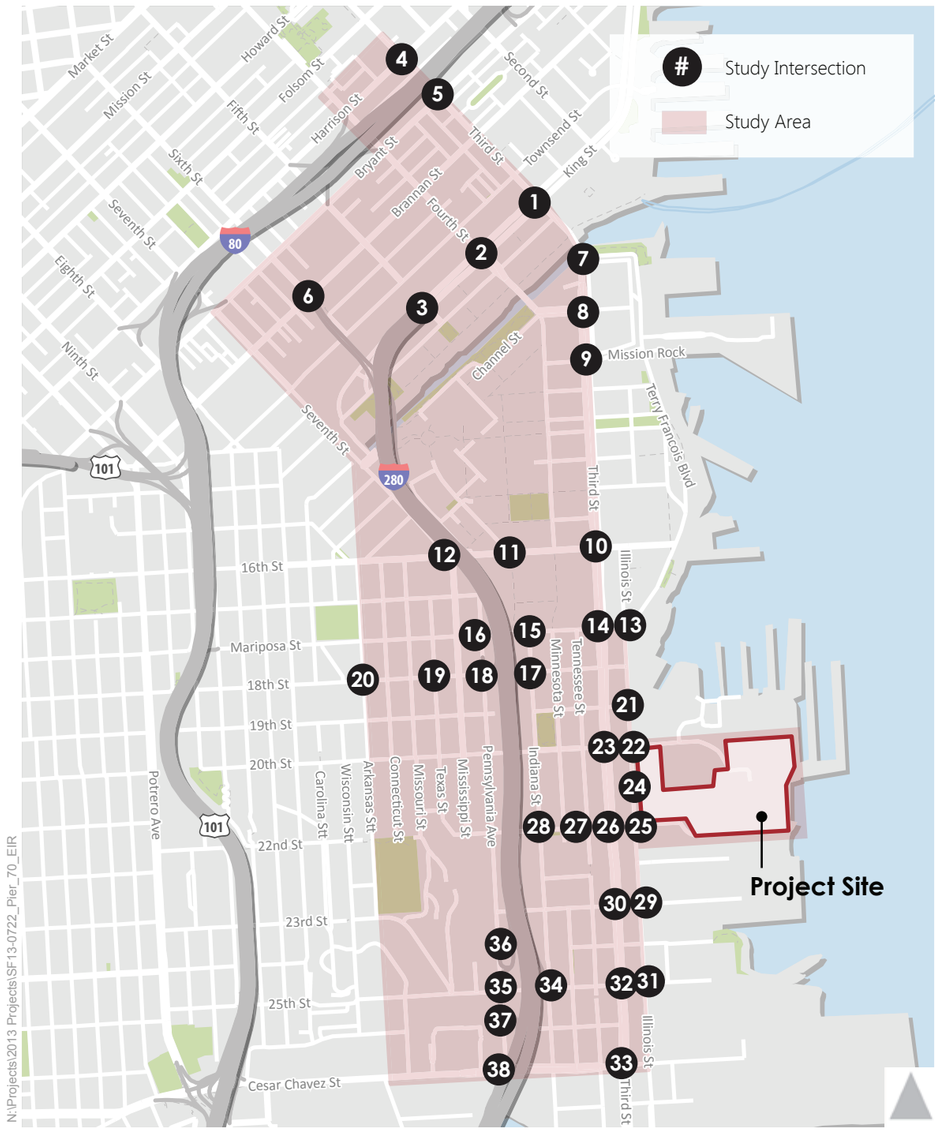


Figure 16A

Cumulative Plus Project Peak Hour Traffic Volumes - Maximum Commercial Scenario



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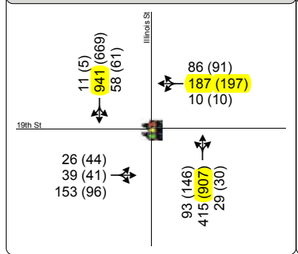
21. Illinois St/19th St



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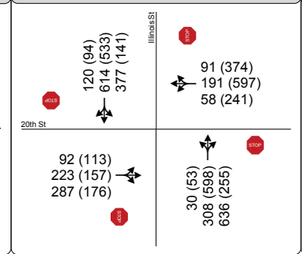
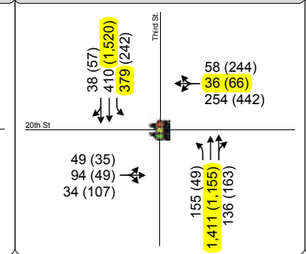


23. Third St./20th St



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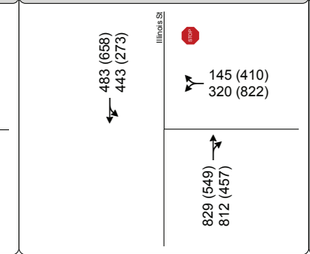

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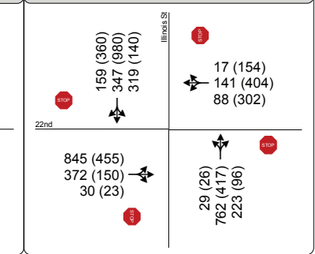

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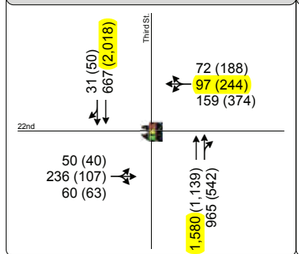
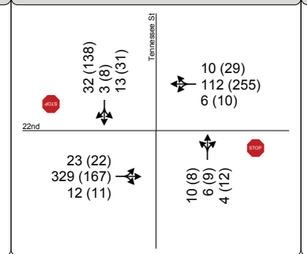


27. Tennessee St/22nd



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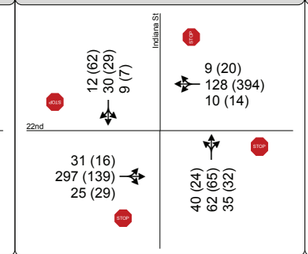

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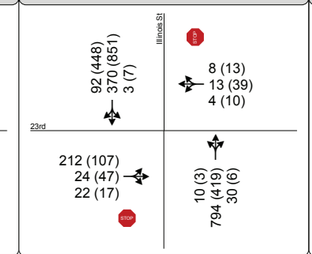

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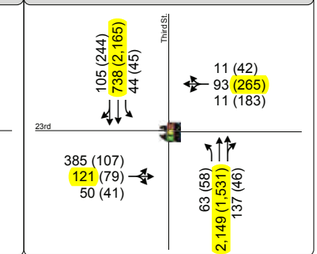
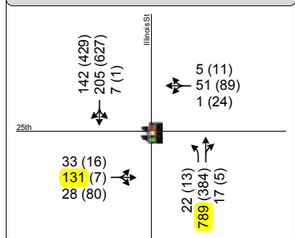
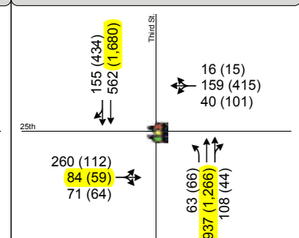


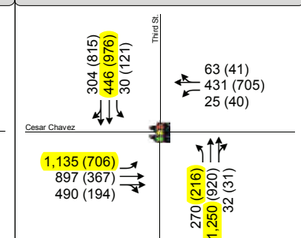
31. Illinois St/25th



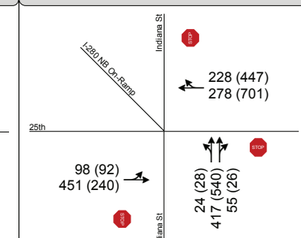
32. Third St./25th



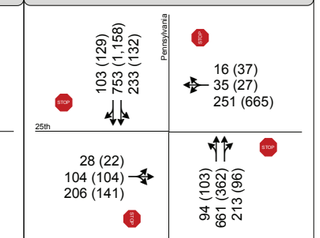
33. Third St./Cesar Chavez



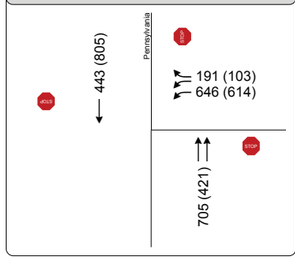
34. 280 NB On-Ramp/Indiana St/25th



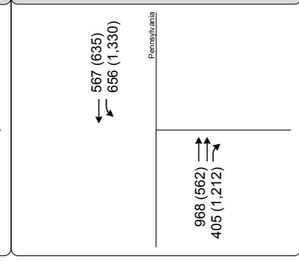
35. Pennsylvania/25th



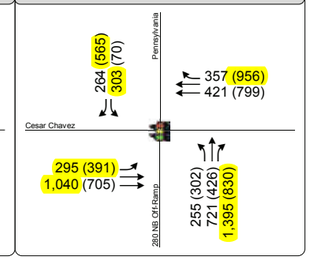
36. Pennsylvania/280 SB Off-Ramp



37. Pennsylvania/280 SB On-Ramp



38. 280 NB Off-Ramp/Cesar Chavez



Turn Lane
AM (PM) Peak Hour Traffic Volume
Traffic Signal
Stop Sign
XX(YY) Indicates critical movement

Figure 16B

Cumulative Plus Project Peak Hour Traffic Volumes - Maximum Commercial Scenario

TABLE 48: WEEKDAY AM PEAK HOUR INTERSECTION LEVELS OF SERVICE - CUMULATIVE PLUS PROJECT

Intersection	Traffic Control	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]
1. King Street / Third Street	Signal	40	D	44	D	**>80**	**F**	**>80**	**F**
2. King Street / Fourth Street	Signal	39	D	**58**	**E**	**>80**	**F**	**>80**	**F**
3. King Street / Fifth Street / I-280 Ramps	Signal	**58**	**E**	**58**	**E**	**>80**	**F**	**>80**	**F**
4. Third Street / Harrison Street	Signal	27	C	35	C	**64**	**E**	**61**	**E**
5. Third Street / Bryant Street	Signal	24	C	31	C	**>80**	**F**	**>80**	**F**
6. Sixth Street / Brannan Street / I-280 Ramps	Signal	39	D	39	D	**>80**	**F**	**>80**	**F**
7. Third Street / Terry A. Francois Boulevard	Signal	15	B	15	B	**>80**	**F**	**79**	**E**
8. Third Street / Channel Street	Signal	37	D	**60**	**E**	**>80**	**F**	**>80**	**F**
9. Third Street / Mission Rock Street	Signal	37	D	52	D	**>80**	**F**	**>80**	**F**
10. 16th Street / Third Street	Signal	24	C	38	D	**>80**	**F**	**>80**	**F**
11. 16th Street / Owens Street	Signal	12	B	**64**	**E**	**>80**	**F**	**>80**	**F**
12. 16th Street / Seventh Street / Mississippi Street	Signal	24	C	**>80**	**F**	**>80**	**F**	**>80**	**F**
13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.	AWSC	22 (EB)	C	**>50 (EB)**	**F**	**>50 (EB)**	**F**	**>50 (EB)**	**F**
14. Mariposa Street / Third Street	Signal	35	D	35	D	**>80**	**F**	**>80**	**F**
15. Mariposa Street / I-280 NB Off-Ramp	Signal	**61**	**E**	29	C	**>80**	**F**	**>80**	**F**
16. Mariposa Street / I-280 SB On-Ramp	***SSSC/Signal***	11 (EB)	B	12	B	**>80**	**F**	**>80**	**F**
17. 18th Street / I-280 Northbound On-Ramp	SSSC	1 (EB)	A	1 (EB)	A	1 (EB)	A	1 (EB)	A
18. 18th Street / I-280 Southbound Off-Ramp	SSSC	13 (SB)	B	13 (SB)	B	**>50 (SB)**	**F**	**>50 (SB)**	**F**
19. 18th Street / Texas Street	SSSC	12 (SB)	B	12 (SB)	B	13 (SB)	B	13 (SB)	B
20. 18th Street / Arkansas Street	AWSC	8 (NB)	A	8 (NB)	A	9 (SB)	A	9 (SB)	A

TABLE 48: WEEKDAY AM PEAK HOUR INTERSECTION LEVELS OF SERVICE - CUMULATIVE PLUS PROJECT									
Intersection	Traffic Control	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]
21. 19th Street / Illinois Street	***SSSC/Signal***	10 (EB)	B	10	B	38	D	45	D
22. 20th Street / Illinois Street	AWSC	9 (NB)	A	14 (SB)	B	**>50 (SB)**	**F**	**>50 (SB)**	**F**
23. 20th Street / Third Street	Signal	15	B	15	B	**>80**	**F**	**>80**	**F**
24. 21st Street / Illinois Street (future)	SSSC	-	-	-	-	**>50 (WB)**	**F**	**>50 (WB)**	**F**
25. 22nd Street / Illinois Street	AWSC	9 (NB)	A	9 (NB)	A	**>50 (EB)**	**F**	**>50 (EB)**	**F**
26. 22nd Street / Third Street	Signal	7	A	7	A	**>80**	**F**	**>80**	**F**
27. 22nd Street / Tennessee Street	SSSC	12 (NB)	B	12 (NB)	B	17 (NB)	C	17 (NB)	C
28. 22nd Street / Indiana Street	AWSC	8 (EB)	A	9 (EB)	A	12 (EB)	B	13 (EB)	B
29. 23rd Street / Illinois Street	SSSC	12 (EB)	B	12 (EB)	B	**>50 (EB)**	**F**	**>50 (EB)**	**F**
30. 23rd Street / Third Street	Signal	10	A	11	B	**>80**	**F**	**>80**	**F**
31. 25th Street / Illinois Street	Signal	8	A	8	A	42	D	**79**	**E**
32. 25th Street / Third Street	Signal	14	B	13	B	**>80**	**F**	**>80**	**F**
33. Cesar Chavez Street / Third Street	Signal	25	C	42	D	**>80**	**F**	**>80**	**F**
34. 25th Street / Indiana Street / I-280 NB On-Ramp	AWSC	10 (EB)	A	10 (EB)	A	**>50 (WB)**	**F**	**>50 (EB)**	**F**
35. 25th Street / Pennsylvania Street	AWSC	16 (SB)	C	19 (SB)	C	**>50 (SB)**	**F**	**>50 (SB)**	**F**
36. Pennsylvania Street / I-280 Southbound Off-Ramp	AWSC	14 (SB)	B	16 (SB)	C	**>50 (SB)**	**F**	**>50 (SB)**	**F**
37. Pennsylvania Street / I-280 Southbound On-Ramp	SSSC	5 (SB)	A	6 (SB)	A	**>50 (SB)**	**F**	**>50 (SB)**	**F**
38. Cesar Chavez Street / Pennsylvania St. / I-280 NB Off	Signal	42	D	**>80**	**F**	**>80**	**F**	**>80**	**F**

TABLE 48: WEEKDAY AM PEAK HOUR INTERSECTION LEVELS OF SERVICE - CUMULATIVE PLUS PROJECT

Intersection	Traffic Control	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]	Avg. Delay[2]	LOS[3]

Notes: **Bold** indicates intersection operations at LOS E or LOS F. ***Bold and italics*** indicates traffic control type change. AWSC = all-way stop control. SSSC = side-street stop control.

1. Baseline condition is a modified existing condition.
2. Delay reported as seconds per vehicle.
3. LOS = Level of Service. For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000.

Source: Fehr & Peers, 2015

TABLE 49: WEEKDAY PM PEAK HOUR INTERSECTION LEVELS OF SERVICE – CUMULATIVE PLUS PROJECT

Intersection	Traffic Control	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]
1. King Street / Third Street	Signal	**79**	**E**	**>80**	**F**	**>80**	**F**	**>80**	**F**
2. King Street / Fourth Street	Signal	52	D	49	D	**>80**	**F**	**>80**	**F**
3. King Street / Fifth Street / I-280 Ramps	Signal	37	D	37	D	**>80**	**F**	**>80**	**F**
4. Third Street / Harrison Street	Signal	32	C	38	D	**>80**	**F**	**>80**	**F**
5. Third Street / Bryant Street	Signal	**57**	**E**	**>80**	**F**	**>80**	**F**	**>80**	**F**
6. Sixth Street / Brannan Street / I-280 Ramps	Signal	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
7. Third Street / Terry A. Francois Boulevard	Signal	12	B	16	B	**>80**	**F**	**>80**	**F**
8. Third Street / Channel Street	Signal	27	C	**77**	**E**	**>80**	**F**	**>80**	**F**
9. Third Street / Mission Rock Street	Signal	21	C	**71**	**E**	**>80**	**F**	**>80**	**F**
10. 16th Street / Third Street	Signal	22	C	35	D	**>80**	**F**	**>80**	**F**
11. 16th Street / Owens Street	Signal	21	C	**>80**	**F**	**>80**	**F**	**>80**	**F**
12. 16th Street / Seventh Street / Mississippi Street	Signal	35	D	**>80**	**F**	**>80**	**F**	**>80**	**F**
13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.	AWSC	10 (SB)	B	19 (WB)	C	**>50 (NB)**	**F**	**>50 (WB)**	**F**
14. Mariposa Street / Third Street	Signal	26	C	28	C	**>80**	**F**	**>80**	**F**
15. Mariposa Street / I-280 NB Off-Ramp	Signal	23	C	41	D	**>80**	**F**	**>80**	**F**
16. Mariposa Street / I-280 SB On-Ramp	***SSSC/Signal***	**>50 (EB)**	**F**	20	B	**>80**	**F**	**>80**	**F**
17. 18th Street / I-280 Northbound On-Ramp	SSSC	1 (EB)	A	1 (EB)	A	1 (EB)	A	1 (EB)	A
18. 18th Street / I-280 Southbound Off-Ramp	SSSC	13 (SB)	B	14 (SB)	B	**35 (SB)**	**E**	29 (SB)	D
19. 18th Street / Texas Street	SSSC	16 (SB)	C	16 (SB)	C	19 (SB)	C	19 (SB)	C

TABLE 49: WEEKDAY PM PEAK HOUR INTERSECTION LEVELS OF SERVICE – CUMULATIVE PLUS PROJECT

Intersection	Traffic Control	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS [2]	Avg. Delay[1]	LOS [2]	Avg. Delay[1]	LOS [2]
20. 18th Street / Arkansas Street	AWSC	8 (SB)	A	8 (SB)	A	9 (WB)	A	9 (WB)	A
21. 19th Street / Illinois Street	***SSSC/Signal***	10 (EB)	B	12	B	**>80**	**F**	**>80**	**F**
22. 20th Street / Illinois Street	AWSC	9 (NB)	A	16 (WB)	C	**>50 (WB)**	**F**	**>50 (WB)**	**F**
23. 20th Street / Third Street	Signal	13	B	16	B	**>80**	**F**	**>80**	**F**
24. 21st Street / Illinois Street (future)	SSSC	-	-	-	-	**>50 (WB)**	**F**	**>50 (WB)**	**F**
25. 22nd Street / Illinois Street	AWSC	9 (NB)	A	9 (SB)	A	**>50 (SB)**	**F**	**>50 (SB)**	**F**
26. 22nd Street / Third Street	Signal	9	A	20	B	**>80**	**F**	**>80**	**F**
27. 22nd Street / Tennessee Street	SSSC	12 (SB)	B	12 (SB)	B	17 (NB)	C	17 (NB)	C
28. 22nd Street / Indiana Street	AWSC	8 (WB)	A	8 (WB)	A	15 (WB)	B	16 (WB)	C
29. 23rd Street / Illinois Street	SSSC	12 (WB)	B	12 (WB)	B	**>50 (EB)**	**F**	**>50 (EB)**	**F**
30. 23rd Street / Third Street	Signal	11	B	15	B	**>80**	**F**	**>80**	**F**
31. 25th Street / Illinois Street	Signal	9	A	9	A	**>80**	**F**	**>80**	**F**
32. 25th Street / Third Street	Signal	13	B	15	B	**>80**	**F**	**>80**	**F**
33. Cesar Chavez Street / Third Street	Signal	38	D	**>80**	**F**	**>80**	**F**	**>80**	**F**
34. 25th Street / Indiana Street / I-280 NB On-Ramp	AWSC	13 (WB)	B	15 (WB)	C	**>50 (WB)**	**F**	**>50 (WB)**	**F**
35. 25th Street / Pennsylvania Street	AWSC	31 (SB)	D	**48 (SB)**	**E**	**>50 (SB)**	**F**	**>50 (WB)**	**F**
36. Pennsylvania Street / I-280 Southbound Off-Ramp	AWSC	18 (SB)	C	21 (SB)	C	**>50 (SB)**	**F**	**>50 (SB)**	**F**
37. Pennsylvania Street / I-280 Southbound On-Ramp	SSSC	5 (SB)	A	5 (SB)	A	**>50 (SB)**	**F**	**>50 (SB)**	**F**
38. Cesar Chavez Street / Pennsylvania St. / I-280 NB Off	Signal	49	D	**61**	**E**	**>80**	**F**	**>80**	**F**

TABLE 49: WEEKDAY PM PEAK HOUR INTERSECTION LEVELS OF SERVICE – CUMULATIVE PLUS PROJECT									
Intersection	Traffic Control	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]

Notes: **Bold** indicates intersection operations at LOS E or LOS F. ***Bold and italics*** indicates traffic control type change. AWSC = all-way stop control. SSSC = side-street stop control.

4. Baseline condition is a modified existing condition.
5. Delay reported as seconds per vehicle.
6. LOS = Level of Service. For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000.

Source: Fehr & Peers, 2015

7.3.6.1 Maximum Residential Scenario

The Cumulative Conditions analysis was reviewed to determine locations at which to study if additional potential measures were necessary throughout the study area. In the Maximum Residential Scenario, the following locations would have been impacted during one of the two peak hours with the previous significance criteria and were examined for potential measures. This section only includes combinations of location and peak hours that were not examined for potential measures in Baseline Conditions.

4. Third Street / Harrison Street

Operations Analysis

As mentioned earlier, the signalized intersection of Third Street / Harrison Street would degrade from acceptable to unacceptable conditions (LOS E) during the PM peak hour under Baseline Plus Project (Maximum Residential Scenario) Conditions. Under 2040 Cumulative Conditions, the intersection operates at LOS F during the AM peak hour. The Proposed Project would add 105 vehicle trips during the AM peak hour scenario to the northbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the AM peak hour. This increase represents a five percent increase to the without Proposed Project movement volume during the AM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

5. Third Street / Bryant Street

Operations Analysis

As mentioned earlier, the signalized intersection of Third Street / Bryant Street operates at LOS F during the PM peak hour without the Proposed Project and the Proposed Project adds more than five percent of the volume to the critical northbound through movement operating at unacceptable LOS F under conditions without the Proposed Project. Under 2040 Cumulative Conditions, the intersection operates at LOS F during the AM peak hour. The Proposed Project would add 59 vehicle trips during the AM peak hour scenario to the northbound right-turn movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the AM peak hour. This increase represents a nine percent increase to the without Proposed Project movement volume during the AM peak hour.

Potential Measure and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

7. Third Street / Terry A. Francois Boulevard

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Terry A. Francois Boulevard operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

Under 2040 Cumulative Conditions, the intersection operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 400 vehicle trips during the PM peak hour scenario to the northbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents a twenty-one percent increase to the without Proposed Project movement volume during the PM peak hour. It should be noted that this intersection is proposed to be removed with the Mission Rock development project.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

14. Mariposa Street / Third Street

Operations Analysis

Under Baseline Conditions, the Proposed Project would cause the LOS at the intersection of Mariposa Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection operates under acceptable conditions in the PM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Under 2040 Cumulative Conditions, the intersection would also operate at LOS F during the PM peak hour without the Proposed Project. During the PM peak hour, the Proposed Project would add 333 vehicle trips to the southbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the

Proposed Project. This increase represents a forty-six percent contribution to the total movement volume during the PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

21. 19th Street / Illinois Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of 19th Street / Illinois Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

Under 2040 Cumulative Conditions, the intersection would operate at LOS F during the PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

32. 25th Street / Third Street

Operations Analysis

The Proposed Project would cause the LOS at the intersection of 25th Street / Third Street to degrade from acceptable to unacceptable conditions during the PM peak hour. Under the Baseline Plus Project (Maximum Residential Scenario), the intersection continues to operate acceptably during the AM peak hour.

Under 2040 Cumulative Conditions, the intersection operates at LOS F during the AM peak hour without the Proposed Project. The Proposed Project would add 122 vehicle trips during the AM peak hour scenario to the eastbound lane group volume and 666 vehicles to the northbound through movement, which are critical movements operating at unacceptable LOS F under conditions without the Proposed Project during the AM peak hour. These increases represent forty-seven and fifty-nine percent increases to the without Proposed Project movement volume during the AM peak hour.

Potential Measure and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

34. 25th Street / Indiana Street / I-280 Northbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Indiana Street / I-280 Northbound On-Ramp / 25th Street operates at LOS C during the PM peak hour. The Proposed Project (Maximum Residential Scenario) would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). The Caltrans peak hour volume signal warrant would be met with the Proposed Project. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Residential Scenario) conditions.

Under 2040 Cumulative Conditions, the intersection operates at LOS F during the AM peak hour and the peak hour signal warrant is met.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection, as mentioned earlier in this chapter. With signalization, this intersection would operate at LOS D or better during both peak hours.

Potential Measure Feasibility

SFMTA and Caltrans believe that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-12 (RES).**

7.3.6.2 Maximum Commercial Scenario

The Cumulative Conditions analysis was reviewed to determine locations at which to study if additional potential measures were necessary throughout the study area. In the Maximum Commercial Scenario, the following locations would have been impacted during one of the two peak hours with the previous significance criteria and were examined for potential measures. This section only includes combinations of location and peak hours that were not examined for potential measures in Baseline Conditions.

5. Third Street / Bryant Street

Operations Analysis

As mentioned earlier, the signalized intersection of Third Street / Bryant Street operates at LOS F during the PM peak hour without the Proposed Project and the Proposed Project adds more than five percent of the volume to the critical northbound through movement operating at unacceptable LOS F under conditions without the Proposed Project. Under 2040 Cumulative Conditions, the intersection operates at LOS F during the AM peak hour. The Proposed Project would add 47 vehicle trips during the AM peak hour scenario to the northbound right-turn movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the AM peak hour. This increase represents a seven percent increase to the without Proposed Project movement volume during the AM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

7. Third Street / Terry A. Francois Boulevard

Operations Analysis

Under Baseline Conditions, the signalized intersection of Third Street / Terry A. Francois Boulevard operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

Under 2040 Cumulative Conditions, the intersection operates at LOS F during the PM peak hour without the Proposed Project. The Proposed Project would add 466 vehicle trips during the PM peak hour scenario to the northbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project during the PM peak hour. This increase represents a twenty-five percent increase to the without Proposed Project movement volume during the PM peak hour. It should be noted that this intersection is proposed to be removed with the Mission Rock development project.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

14. Mariposa Street / Third Street

Operations Analysis

Under Baseline Conditions, the Proposed Project would cause the LOS at the intersection of Mariposa Street / Third Street to degrade from acceptable to unacceptable conditions during the AM peak hour. The intersection operates under acceptable conditions in the PM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Under 2040 Cumulative Conditions, the intersection would also operate at LOS F during the PM peak hour without the Proposed Project. During the PM peak hour, the Proposed Project would add 269 vehicle trips to the southbound through movement, which is a critical movement operating at unacceptable LOS F under conditions without the Proposed Project. This increase represents a thirty-seven percent contribution to the total movement volume during the PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

21. 19th Street / Illinois Street

Operations Analysis

Under Baseline Conditions, the signalized intersection of 19th Street / Illinois Street operates at an acceptable level of service during both the AM and PM peak hour. Under the Baseline Plus Project (Maximum Commercial Scenario), the intersection continues to operate acceptably during both the AM and PM peak hour.

Under 2040 Cumulative Conditions, the intersection would operate at LOS F during the PM peak hour.

Potential Measure Considered and Feasibility

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Therefore, these types of improvements were not considered at this intersection.

34. 25th Street / Indiana Street / I-280 Northbound On-Ramp

Operations Analysis

Under Baseline Conditions, the unsignalized intersection of Indiana Street / I-280 Northbound On-Ramp / 25th Street operates at LOS C during the PM peak hour. The Proposed Project (Maximum Commercial Scenario) would cause the LOS at the intersection to degrade from acceptable to unacceptable conditions during PM peak hour (to LOS F). The Caltrans peak hour volume signal warrant would be met with the Proposed Project. The intersection operates under acceptable conditions in the AM peak hour in both the Baseline and Baseline Plus Project (Maximum Commercial Scenario) conditions.

Under 2040 Cumulative Conditions, the intersection operates at LOS F during the AM peak hour and the peak hour signal warrant is met.

Potential Measure Considered

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection, as mentioned earlier in this chapter. With signalization, this intersection would operate at LOS D or better during both peak hours.

Potential Measure Feasibility

SFMTA and Caltrans believe that signalization of this intersection is feasible and the preferred potential measure at this intersection. Therefore, the potential measure mentioned above is noted as **Potential Measure TR-12 (COM).**

Table 50 shows a summary of the intersection analysis results for both scenarios. The Maximum Commercial Scenario would have significantly impacted one more intersection overall, as well as during each of the peak hours. All of the locations that would have been significantly impacted by the Maximum Residential Scenario would also be significantly impacted by Maximum Commercial Scenario.

TABLE 50: CUMULATIVE CONDITIONS IMPACT SUMMARY				
Intersection	AM Peak Hour		PM Peak Hour	
	Cumulative Plus Project – Residential	Cumulative Plus Project – Commercial	Cumulative Plus Project – Residential	Cumulative Plus Project – Commercial
1. King Street / Third Street	S/U	S/U	S/U	S/U
2. King Street / Fourth Street	S/U	S/U		
3. King Street / Fifth Street / I-280 Ramps			S/U	S/U
4. Third Street / Harrison Street	**C**		S/U	S/U
5. Third Street / Bryant Street	**C**	**C**	S/U	S/U
6. Sixth Street / Brannan Street / I-280 Ramps			S/U	S/U
7. Third Street / Terry A. Francois Boulevard			**C**	**C**
8. Third Street / Channel Street	S/U	S/U	S/U	S/U
9. Third Street / Mission Rock Street	S/U	S/U	S/U	S/U
10. 16th Street / Third Street	S/U	S/U	S/U	S/U
11. 16th Street / Owens Street	S/U	S/U	S/U	S/U
12. 16th Street / Seventh Street / Mississippi Street	S/U	S/U	S/U	S/U
13. Mariposa Street / Terry A. Francois Blvd. / Illinois St.	S/U	S/U	S/U	S/U
14. Mariposa Street / Third Street	S/U	S/U	**C**	**C**
15. Mariposa Street / I-280 NB Off-Ramp				
16. Mariposa Street / I-280 SB On-Ramp				
17. 18th Street / I-280 Northbound On-Ramp				
18. 18th Street / I-280 Southbound Off-Ramp				
19. 18th Street / Texas Street				
20. 18th Street / Arkansas Street				
21. 19th Street / Illinois Street			**C**	**C**
22. 20th Street / Illinois Street	S/U	S/U	S/U	S/U
23. 20th Street / Third Street	S/U	S/U	S/U	S/U
24. 21st Street / Illinois Street (future)	S/U	S/U	S/U	S/U
25. 22nd Street / Illinois Street	S/U	S/U	S/U	S/U
26. 22nd Street / Third Street	S/U	S/U	S/U	S/U
27. 22nd Street / Tennessee Street				
28. 22nd Street / Indiana Street				
29. 23rd Street / Illinois Street	S/U	S/U	S/U	S/U

TABLE 50: CUMULATIVE CONDITIONS IMPACT SUMMARY

Intersection	AM Peak Hour		PM Peak Hour	
	Cumulative Plus Project – Residential	Cumulative Plus Project – Commercial	Cumulative Plus Project – Residential	Cumulative Plus Project – Commercial
30. 23rd Street / Third Street	S/U	S/U	S/U	S/U
31. 25th Street / Illinois Street				S/U
32. 25th Street / Third Street	**C**	S/U	S/U	S/U
33. Cesar Chavez Street / Third Street	S/U	S/U	S/U	S/U
34. 25th Street / Indiana Street / I-280 NB On-Ramp	**C**	**C**	S/U	S/U
35. 25th Street / Pennsylvania Street	S/U	S/U	S/U	S/U
36. Pennsylvania Street / I-280 Southbound Off-Ramp			S/U	S/U
37. Pennsylvania Street / I-280 Southbound On-Ramp				
38. Cesar Chavez Street / Pennsylvania St / I-280 NB Off	S/U	S/U	S/U	S/U

Notes: X indicates significantly impact intersection. Blank cell indicates less-than-significant impact. **C** indicates new significant and unavoidable impact as compared to Baseline Plus Project Conditions (Note that the references to significant impact refers to conditions prior to the City's change in traffic impact metric from LOS to VMT. Under the new metric, LOS conditions are no longer used to form the basis for significant impacts.)
Source: Fehr & Peers, 2015

7.3.7 Cumulative Freeway Analysis

Traffic volumes from SF-CHAMP were used to develop the Cumulative 2040 freeway analysis. **Tables 51** and **52** compare the LOS under Existing, Baseline and Cumulative conditions in the AM peak hour and PM peak hour.

The **I-280 northbound on-ramp at Indiana Street / 25th Street** merge freeway segment operates at LOS F during the AM peak hour both with and without the Proposed Project, though the Proposed Project contributes less than four percent to the freeway segment volume. The **I-280 southbound on-ramp at Mariposa Street** merge freeway segment operates at LOS F during the PM peak hour both with and without the Proposed Project, though the Proposed Project contributes less than four percent to the freeway segment volume. Because the Proposed Project would contribute less than five percent of the total freeway volume to these segments operating unacceptably, the Proposed Project's impact on these segments would have been considered less than significant.

The Proposed Project would have had significant impact on five freeway segments (the freeway segments that would be impacted were the same for both the Maximum Residential Scenario and the Maximum Commercial Scenario). These same impacts were also identified in the corresponding Baseline Plus Project scenario (Maximum Residential Scenario and/or Maximum Commercial Scenario) with the exception of the I-280 southbound off-ramp at Pennsylvania Street / Cesar Chavez Street:

- The **I-280 northbound off-ramp at Mariposa Street** diverge freeway segment operates at LOS F during the AM peak hour and PM peak hour both with and without the Proposed Project. The Proposed Project

adds 275 (Maximum Residential Scenario) to 300 vehicle trips (Maximum Commercial Scenario) to this diverge segment during the AM peak hour, which is approximately five percent of the freeway volume. While the intersection with Mariposa Street will be improved at the terminus of this ramp, no changes are planned at the freeway diverge segment.

- The **I-280 northbound off-ramp at Pennsylvania Street / Cesar Chavez Street** diverge freeway segment operates at LOS E during the AM peak hour and LOS D during the PM peak hour without the Proposed Project. With the Proposed Project, the off-ramp would operate at LOS F during the AM peak hour and LOS E during the PM peak hour.

- The **I-280 southbound on-ramp at Sixth Street** merge freeway segment operates at LOS C during the AM peak hour without the Proposed Project and LOS F with the Proposed Project. The section operates at LOS F during the PM peak hour both with and without the Proposed Project. The Proposed Project adds 193 (Maximum Commercial Scenario) to 248 vehicle trips (Maximum Residential Scenario) to this weave segment during the PM peak hour, which is approximately four to six percent of the freeway volume.

- The **I-280 southbound on-ramp at Pennsylvania Street / 25th Street** merge freeway segment operates at LOS E during the PM peak hour without the Proposed Project. With the Proposed Project, the off-ramp would operate at LOS F during the PM peak hour.

- The **I-280 southbound off-ramp at Pennsylvania Street / Cesar Chavez Street** diverge freeway segment operates at LOS D during the PM peak hour without the Proposed Project. With the Proposed Project, the off-ramp would operate at LOS F during the PM peak hour.

No feasible potential measures are available for the freeway ramp impacts because there is insufficient physical space for additional capacity without redesign of the I-280 ramp and mainline structures, which may require acquisition of additional right-of-way and may inhibit mainline operations. Other potential measures to improve operations would involve reducing the traffic volumes entering the weaving section, either through ramp metering, tolling, or other means. Ramp metering, however, could exacerbate congestion on streets leading to the on-ramp (though ramp metering has also been implemented without such impacts), while tolling would need to be implemented as a system-wide improvement in order to prevent concentration of vehicular traffic and increased congestion on non-tolled facilities. Moreover, any changes to the ramps would require approval of Caltrans, which operates the freeways and ramps.

TABLE 51: AM PEAK HOUR FREEWAY LEVELS OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS

Freeway Segment	Facility Type	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Density[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]
Northbound I-280									
Sixth Street off-ramp	Ramp Diverge	12	B	12	B	17	B	16	B
Mariposa Street off-ramp	Ramp Diverge	25	C	**-**	**F**	**-**	**F**	**-**	**F**
18th Street on-ramp	Ramp Merge	18	B	18	B	26	C	26	C
Indiana Street / 25th Street on-ramp	Ramp Merge	28	C	**-**	**F**	**-**	**F**	**-**	**F**
Pennsylvania Street / Cesar Chavez Street on-ramp	Ramp Merge	34	D	**41**	**E**	**-**	**F**	**-**	**F**
Southbound I-280									
Sixth Street on-ramp	Weave	1,234	C	1,240	C	**1,820**	**F**	**1,854**	**E**
Mariposa Street on-ramp	Ramp Merge	17	B	18	B	23	C	23	C
18th Street off-ramp	Ramp Diverge	14	B	14	B	22	C	22	C
Pennsylvania Street / 25th Street on-ramp	Ramp Merge	19	B	20	C	27	D	25	C
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	20	B	20	C	26	C	26	C

Notes:

1. Baseline condition is a modified existing condition.
2. Density of vehicles per segment. Measured in passenger cars per mile per lane (pc/mi/ln). Service volume shown for weaving segment. No density value is presented for diverge or merge segments where the demand volume exceeds the capacity, per *2000 Highway Capacity Manual*.
3. Segments operating at LOS E or LOS F conditions highlighted in **bold.**

Source: Fehr & Peers, 2015

TABLE 52: PM PEAK HOUR FREEWAY LEVELS OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS

Freeway Segment	Facility Type	Existing Conditions		Baseline Conditions[1]		Cumulative Plus Project – Residential		Cumulative Plus Project – Commercial	
		Density[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]	*Density*[2]	LOS[3]
Northbound I-280									
Sixth Street off-ramp	Ramp Diverge	11	B	11	B	14	B	14	B
Mariposa Street off-ramp	Ramp Diverge	25	C	26	C	**36**	**E**	**36**	**E**
18th Street on-ramp	Ramp Merge	16	B	16	B	22	C	22	C
Indiana Street / 25th Street on-ramp	Ramp Merge	20	C	21	C	30	D	30	D
Pennsylvania Street / Cesar Chavez Street on-ramp	Ramp Merge	30	D	29	D	**41**	**E**	**39**	**E**
Southbound I-280									
Sixth Street on-ramp	Ramp Merge	**1,951**	**F**	**1,954**	**F**	**2,416**	**F**	**2,388**	**F**
Mariposa Street on-ramp	Ramp Merge	29	D	**-**	**F**	**-**	**F**	**-**	**F**
18th Street off-ramp	Ramp Diverge	22	C	22	C	27	C	27	C
Pennsylvania Street / 25th Street on-ramp	Ramp Merge	33	D	38	**E**	**-**	**F**	**-**	**F**
Pennsylvania Street / Cesar Chavez Street off-ramp	Ramp Diverge	31	D	34	D	**-**	**F**	**-**	**F**

Notes:

1. Baseline condition is a modified existing condition.
2. Density of vehicles per segment. Measured in passenger cars per mile per lane (pc/mi/ln). Service volume shown for weaving segment. No density value is presented for diverge or merge segments where the demand volume exceeds the capacity, per *2000 Highway Capacity Manual*.
3. Segments operating at LOS E or LOS F conditions highlighted in **bold.**

Source: Fehr & Peers, 2015

8 PARKING CONDITIONS (FOR INFORMATIONAL DISCUSSION ONLY)

8.1 EXISTING PARKING CONDITIONS

This section provides an inventory of existing on-street and off-street parking facilities in the Proposed Project study area. Information on off-street and metered on-street parking is available through SF*park*, which is a SFMTA program that employs adjustable meter and garage pricing to achieve a balance between available parking spaces and demand. The remaining parking data were collected through surveys of the parking study area conducted in September 2013 for this analysis. **Figure 17** shows the parking study area, generally within a three-block distance from the Proposed Project site, which is bounded Mariposa Street to the north, Indiana Street to the west, 25th Street to the south, and the San Francisco Bay to the east. Parking supply and occupancy sheets are provided in **Appendix I**.

8.1.1 Planning Code Parking Requirements

This Proposed Project currently falls within the Heavy Industrial (M-2) designation for zoning use districts, though the Proposed Project would re-zone the site to add a new Pier 70 Special Use District (SUD). Under this designation, the City's Planning Code does not have parking minimums or maximum requirements. However, the Pier 70 Special Use District would establish parking maximums for the Proposed Project. No more than 0.75 parking spaces may be provided per residential dwelling unit. No more than one parking space per 1,000 square feet of gross floor area for the office, commercial, retail, arts, or light industrial uses may be provided. The maximum amount of parking that would be provided is 3,370 spaces for the Maximum Residential Scenario and 3,496 spaces for the Maximum Commercial Scenario.

8.1.2 On-Street Parking

There are 2,410 on-street parking spaces in the parking study area. Most of these parking spaces are unmetered and unrestricted. Motorcycle parking and commercial loading combine to make up approximately one percent of the metered parking spaces in the parking study area. Residential permit parking (RPP) area X is designated along the west side of Minnesota Street (from 20th Street to 22nd Street), the east side of Minnesota Street (from 18th Street to Tubbs Street), the west side of Tennessee Street (from 19th Street to Tubbs Street), and the east side of Tennessee Street (from 20th Street to Tubbs Street). It should be noted that an additional RPP area will be designated for the Dogpatch neighborhood.

Parking is available on most block faces through the study area. On-street parking is not permitted on:

- Mariposa Street (South side between Third Street and Tennessee Street)
- Mariposa Street (North side between Illinois Street and Third Street)
- 18th Street (Both sides between Minnesota Street and Indiana Street)
- 20th Street (North side between Third Street and Indiana Street)
- Tubbs Street (Both sides between Tennessee Street and Indiana Street)
- 23rd Street (North side between Third Street and Indiana Street)

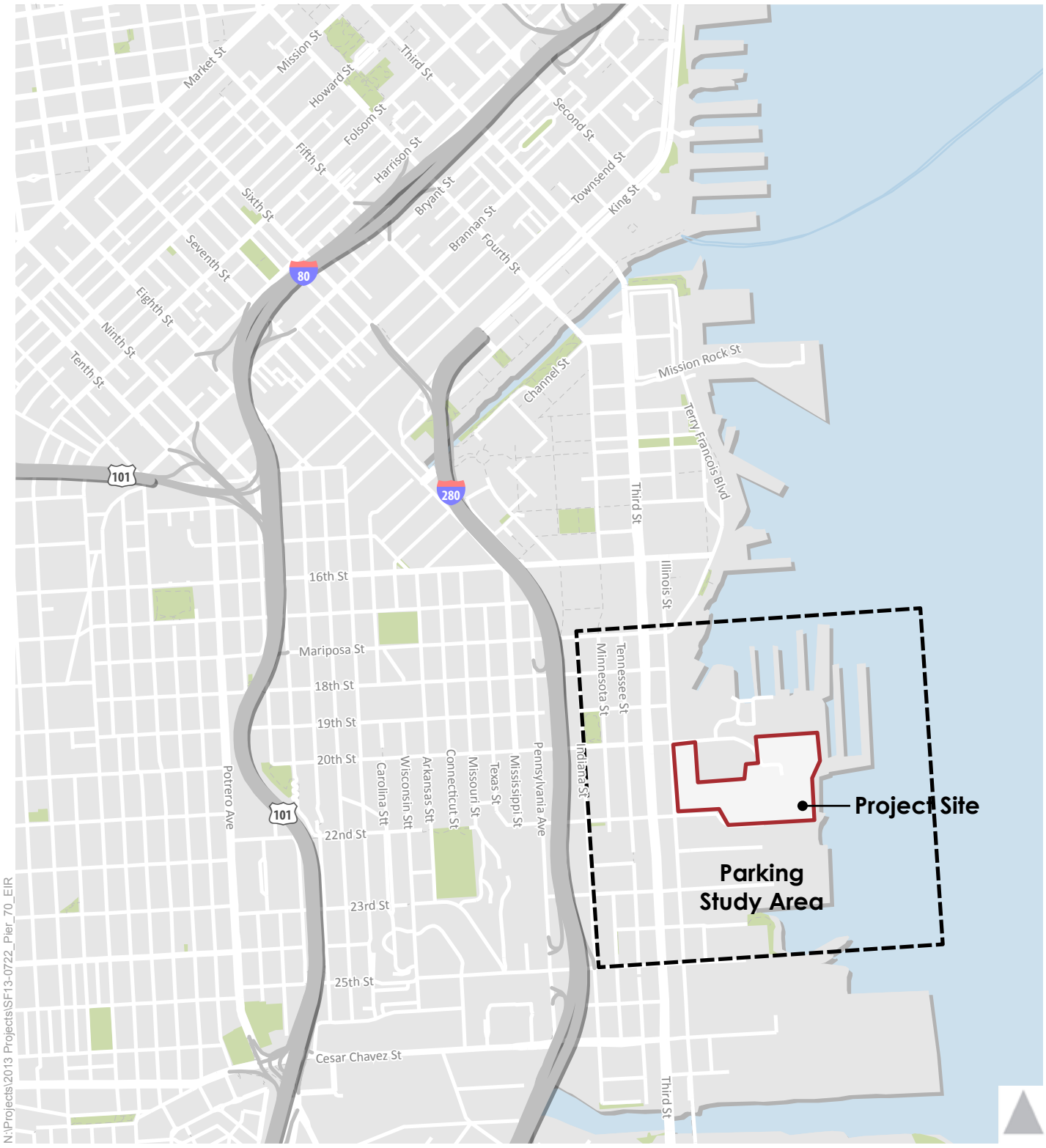
- 25th Street (Both sides between Illinois Street and Third Street)
- Third Street (Both sides between Mariposa Street and 18th Street)
- Third Street (Both sides between 19th Street and 20th Street)
- Third Street (Both sides between 23rd Street and 24th Street)
- Illinois Street (Both sides between 18th Street and 19th Street)
- Illinois Street (West side between 20th Street and 22nd Street)

The most frequently noted instances of illegal on-street parking on major streets in the parking study area were vehicles parked in active driveways and vehicles parked in red zones (red curb indicates no parking at any time). Additionally, some vehicles illegally parked at white curbs in passenger loading zones, some vehicles parked at meters during designated commercial vehicle-only hours, and some vehicles parked at expired meters or during restricted hours. Based on field observations, on-street parking occupancy is fairly high across the parking study area during the afternoon and evening periods. Overall, nearly 82 percent of the on-street public parking was occupied during the midday (1:30 PM to 3:00 PM) period and 69 percent was occupied during the evening period (6:30 PM to 8:00 PM). Some of the on-street parking around the 22nd Street Caltrain station is likely occupied by commuters as a park-and-ride area. **Figure 18** shows the occupancy on a block-by-block level for the midday and evening periods. **Table 53** provides a summary of on-street parking occupancy in the Project area.

TABLE 53: ON-STREET PARKING SUMMARY

Type of Parking	Supply	Average Occupancy	
		Midday (1:30 PM to 3:00 PM)	Evening (6:30 PM to 8:00 PM)
General Parking	**2,392**	**82% (40% minimum to >100% maximum)**	**69% (27% minimum to 100% maximum)**
Project-adjacent blockfaces	203	96%	45%
Commercial (metered)	2	50%	0%
Accessible parking	10	90%	40%
Motorcycle	6	50%	33%

Source: Fehr & Peers, 2015.



Parking Study Area

Project Site

Figure 17

Parking Study Area

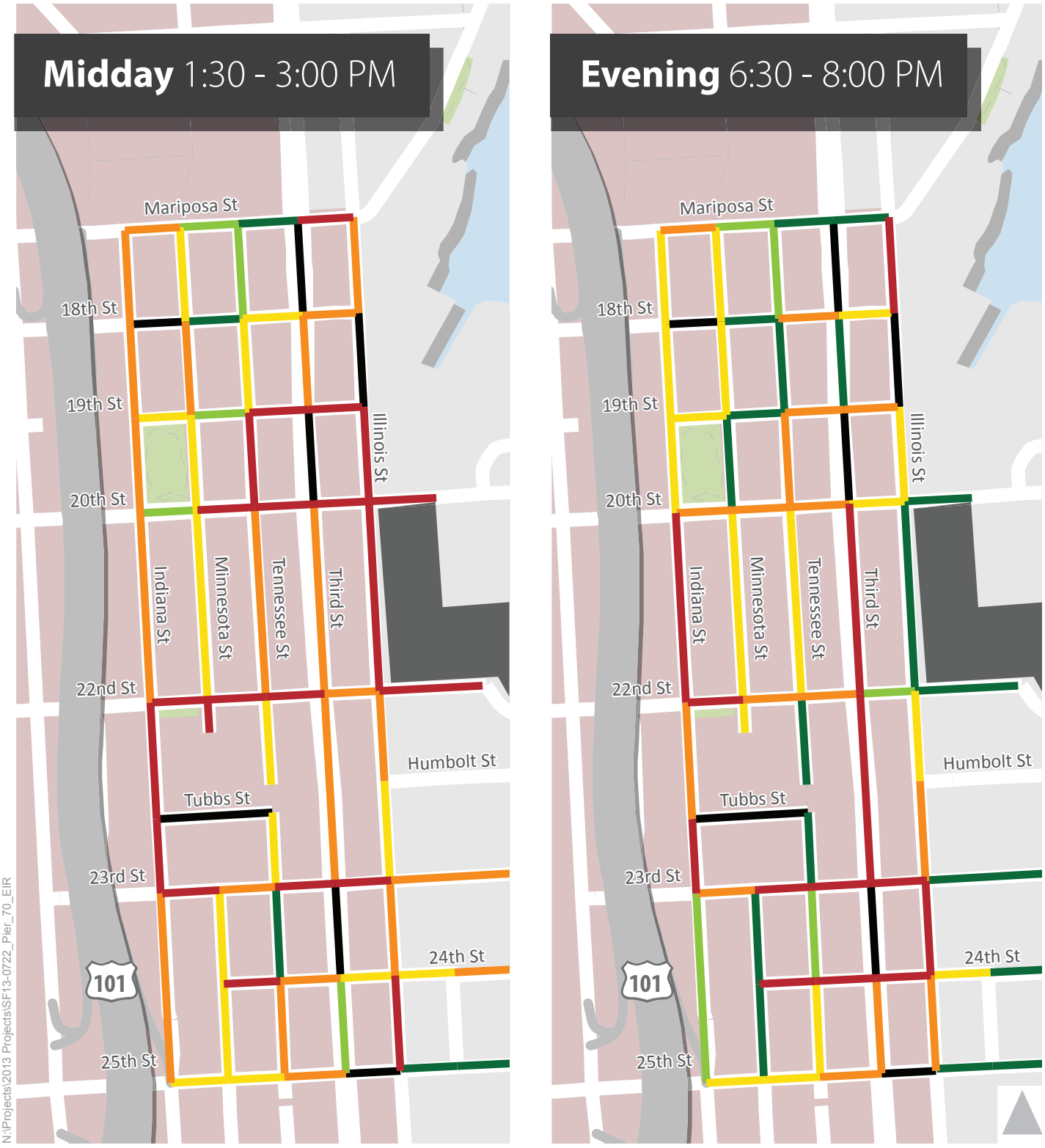


Figure 18

On-Street Parking Occupancy

8.1.3 Off-Street Parking

Data from SF*park*, as well as from canvassing the study area, revealed no publicly available lots for general use parking in the parking study area. There are some parking lots in the area for permit holders or customer parking. A publicly available lot at the southeast corner of Illinois Street and 20th Street with 117 spaces was opened in early 2015 after parking occupancy data were collected; this lot would be removed with the Project and is not included in the parking supply.

8.2 PARKING DEMAND

The daily parking demand generated by the Proposed Project was forecasted using the methodology described in the *SF Guidelines* and is detailed in *Pier 70 MIxed-Use District Project – Estimation of Project Travel Demand* in Appendix E. The actual demand for parking that a project may generate is not necessarily the same as what is required by the Planning Code. In the Maximum Residential Scenario, 1,000 of the 3,025 residential units were assumed to be studio or one-bedroom units, and 545 of the 1,645 residential units were assumed to be studio or one-bedroom units in the Maximum Commercial Scenario. Per the *SF Guidelines*, the calculated residential parking demand is 1.1 spaces for each dwelling unit for a studio/one-bedroom unit and 1.5 spaces for each two- or three-bedroom dwelling unit. Long-term parking demand for the office, retail, and restaurant uses was estimated by applying the average mode split and the vehicle occupancy from the trip generation estimation to the number of employees for each of the proposed land uses. Short-term parking demand for these uses was estimated based on the total daily visitor trips and an average daily parking turnover rate (5.5 vehicles per space per day) obtained from the *SF Guidelines*.

Table 54 shows that the Proposed Project would create a peak demand for 7,078 parking spaces during the midday and 6,127 parking spaces in the evening under the Maximum Residential Scenario, and 7,633 parking spaces during the midday and 4,563 parking spaces in the evening under the Maximum Commercial Scenario. The existing uses at the Proposed Project site have been assumed to contribute relatively little to existing on-street parking demand; therefore, the Proposed Project's parking demand would be addressed through off-street parking provided by the Proposed Project, on-street parking provided by the Proposed Project, and existing on-street supply in the study area.

The forecasted peak midday demand (Maximum Residential Scenario) of 7,078 spaces for all proposed uses is 3,578 spaces more than the 3,500 spaces (including the on-street parking provided by the Proposed Project) that the Proposed Project would provide, and the forecasted peak Proposed Project-generated demand during the evening for as many as 6,127 parking spaces would be 2,627 spaces more than the Proposed Project would provide.

The forecasted peak midday demand (Maximum Commercial Scenario) of 7,633 spaces for all proposed uses is 4,003 spaces more than the 3,630 spaces that the Proposed Project would provide, and the forecasted peak Proposed Project-generated demand during the evening for as many as 4,563 parking spaces would be 933 spaces more than the Proposed Project would provide.

Because of the changing nature of the Proposed Project study area (including the Central Subway construction), the intensity and mix of uses proposed by the Proposed Project, and the TDM Program proposed by the Proposed Project, the calculation likely overstates the parking demand and the shortfall. The Proposed Project would generally provide shared parking throughout the site to provide consolidated parking areas for general use by the public, residents, employees, and visitors. Complementary uses, such as the residential (requiring overnight parking) and office or retail (requiring daytime parking), help to minimize the number of parking spaces needed.

TABLE 54: PROPOSED PROJECT PEAK PARKING DEMAND						
Land Use	Maximum Residential Scenario			Maximum Commercial Scenario		
	Long Term Parking Demand	Short Term Parking Demand	Total Parking Demand	Long Term Parking Demand	Short Term Parking Demand	Total Parking Demand
Midday						
Residential	3,310	-	3,310	1,800	-	1,800
Office	1,643	205	1,848	3,326	457	3,783
PDR	214	27	241	211	29	240
Retail	316	734	1,050	320	820	1,122
Restaurant	79	550	629	80	608	688
TOTAL	**5,562**	**1,516**	**7,078**	**5,737**	**1,896**	**7,633**
Evening						
Residential	4,138	-	4,138	2,250	-	2,250
Office	165	11	176	333	23	356
PDR	22	2	24	22	2	24
Retail	316	734	1,050	316	660	976
Restaurant	79	734	813	80	811	891
TOTAL	**4,720**	**1,407**	**6,127**	**3,005**	**1,558**	**4,563**

Source: *SF Guidelines* Appendix G; Adavant Consulting, 2016.

The lack of parking may result in motorists looking for parking outside of the project site. However, there is an existing residential permit parking area along Minnesota and Tennessee streets in the vicinity, and, as noted above, a new RPP area is proposed for the Dogpatch area that is closer to the project site. These features would discourage spillover parking from the Proposed Project into adjacent neighborhoods.

Some drivers would shift to public transit or other modes of travel such as bicycling, use carshare facilities when a vehicle is needed, and would not own a car. It is possible that such a shift from automobile use to transit would add additional demand to public transit facilities.

8.3 PARKING ANALYSIS



This section includes a discussion of the existing requirements outlined in the San Francisco Planning Code and available parking supply.

San Francisco does not consider parking supply as part of the permanent physical environment and therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. The San Francisco Planning Department acknowledges, however, that parking conditions may be of interest to the public and the decision makers. Therefore, this report presents a parking analysis for information purposes. As noted elsewhere in this report, in September 2013, Senate Bill 743 (SB 743) was passed into law, starting a process that could fundamentally change transportation impact analysis as part of CEQA compliance. These changes will include elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts in many parts of California. While the CEQA Guidelines update for SB 743 is still in preliminary form, a major tenet of the bill is that parking

impacts will not be considered significant impacts on the environment for select development projects within infill areas with nearby transit service, conditions that this Proposed Project would meet.

Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel.

Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, the Proposed Project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact (CEQA Guidelines § 15131(a)). The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City's "Transit First" policy. The City's Transit First Policy, established in the City's Charter Article 8A, Section 8A.115. provides that "parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation."

The transportation analysis accounts for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, by assuming that all drivers would attempt to find parking at or near the Proposed Project site and then seek parking farther away if convenient parking is unavailable. Moreover, the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Hence, any secondary environmental impacts which may result from a shortfall in parking in the vicinity of the Proposed Project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses, reasonably addresses potential secondary effects.

In summary, changes in parking conditions are considered to be social impacts rather than impacts on the physical environment. Accordingly, the following parking analysis is presented for informational purposes only.

8.3.1 Parking Summary

This section includes a discussion of the Proposed Project's parking supply and the calculated Proposed Project-generated parking demand. In addition, a review of vehicular circulation within the parking area (where plans were available) was conducted and is described. A summary of the Proposed Project's parking requirements is shown in **Table 29**. Rates used for the Planning Code calculations can be found in Section 1 below. Additional information about existing on-street and off-street parking conditions can be found in **Appendix I**.

TABLE 29: PARKING SUPPLY, DEMAND, AND CODE REQUIREMENTS						
Land Use	Proposed Supply	Existing On-Street Parking Surplus	Existing Off-Street Parking Surplus	SUD Parking Requirements[1]	Calculated Peak Demand	Surplus / (Deficit)
Midday						
Residential	3,500	429	--	--	7,078	(3,149)
Commercial	3,630	429	--	--	7,633	(3,574)
Evening						
Residential	3,500	741	--	--	6,127	(1,886)
Commercial	3,630	741	--	--	4,563	(192)

Notes:

1. See Section 5.9.2 for additional detail.

Source: *SF Guidelines*, 2002; Fehr & Peers, 2015

8.3.2 Planning Code Parking Requirements

This Proposed Project currently falls within the Heavy Industrial (M-2) designation for zoning use districts, though the Proposed Project would re-zone the site to add a new Pier 70 Special Use District (SUD). Under this designation, the City's Planning Code does not have parking minimums or maximum requirements. However, the Pier 70 Special Use District would establish parking maximums for the Proposed Project. No more than 0.75 parking spaces may be provided per residential dwelling unit. No more than one parking space per 1,000 square feet of gross floor area for the office, commercial, retail, arts, or light industrial uses may be provided. However, the maximum amount of parking that may be provided is 3,370 spaces for the Maximum Residential Scenario and 3,496 spaces for the Maximum Commercial Scenario.

8.3.3 On-Street Parking

Of the parking totals shown in **Table 29**, 285 would be public on-street parking spaces along most of the internal circulation streets, including 20th Street, 21st Street, 22nd Street, Louisiana Street, and Maryland Street. The Proposed Project would also remove 52 public on-street parking spaces along 20th Street and 22nd Street east of Illinois Street, resulting in a net increase of 233 parking spaces in the vicinity of the Proposed Project site. On-street parking would support the retail, providing customers with access to stores and businesses. On-street parking also acts as a traffic calming measure and would improve the pedestrian experience by providing a buffer from the travelway.

8.3.4 Parking Circulation Plans

Detailed parking garage design plans have not been developed, though standards and guidelines for their design have been completed and are included in the Pier 70 Design for Development Guidelines. The Guidelines (Section 9.5.2) state that "[t]wo garage entrances of up to 22 feet in width shall be allowed…[t]he minimum distance of garage entry and exists shall be a minimum of 75 feet from the corner of the intersections." Additional guidelines state that no structures or walls shall be located within 10 feet of the parking access driveway. In order to avoid queuing of cars onto the Proposed Project streets, the drop-down arm that shall control access from the garage to the street shall be located a minimum of 80 feet from the property line.

Detailed parking garage plans should be reviewed prior to building permit issuance. The plans should be reviewed for access and circulation for all modes (vehicles, pedestrians, and bicyclists).

9 MITIGATION AND POTENTIAL MEASURES

This chapter presents the transportation mitigation measures that would be required to reduce the significant impacts of the Proposed Project, and conclusions about the level of impacts after implementation of recommended mitigation measures. In some cases, no significant impact was identified; however, a potential measure was noted that would improve conditions.

9.1 TRAFFIC

No significant environmental impacts have been identified. No mitigation required.

9.2 TRANSIT

Mitigation Measure TR-1 (RES/COM): Increased Bus Service Capacity for SFMTA

Prior to approval of phase applications, project sponsors shall demonstrate that the capacity of the 48 Quintara/24th Street bus route has not exceeded 85 percent utilization, and that future demand associated with build-out and occupancy of the phase will not cause the route to exceed its utilization. Forecasts of travel behavior of future phases could be based on trip generation rates forecast in the TIS or based on subsequent surveys of occupants of the project.

If trip generation calculations or monitoring surveys demonstrate that a specific phase of the Proposed Project will cause capacity on the 48 Quintara/24th Street route to exceed 85 percent, the project sponsors shall provide capital costs for increased capacity on the route in a manner deemed acceptable by SFMTA through the following means:

- The project sponsors shall pay the capital costs for additional buses (up to a maximum of four in the Maximum Residential Scenario and six in the Maximum Commercial Scenario). While the project sponsors could assist with purchasing the buses, SFMTA would need to find funding to pay for the added operating cost associated with operating increased service made possible by the increased vehicle fleet. The source of that funding has not been established.

Alternatively, if SFMTA determines that other measures to increase capacity along the route would be more desirable than adding vehicles, the project sponsors shall pay an amount equivalent to the cost of the required number of buses toward completion of one or more of the following, as determined by SFMTA:

- Convert to using higher-capacity vehicles on the 48 Quintara/24th Street route. In this case, the project sponsors shall pay a portion of the capital costs to convert the route to articulated buses. Some bus stops along the route may not currently be configured to accommodate the longer articulated buses. Some bus zones could likely be extended by removing one or more parking spaces; in some locations, appropriate space may not be available. The project sponsors' contribution may not be adequate to facilitate the full conversion of the route to articulated buses; therefore, a source of funding would need to be established to complete the remainder, including improvements to bus stop capacity at all of the bus stops along the route that do not currently accommodate articulated buses.
- SFMTA may determine that instead of adding more buses to a congested route, it would be more desirable to increase travel speeds along the route. In this case, the project sponsors' contribution would be used to fund a study to identify appropriate and feasible improvements

and/or implement a portion of the improvements that would increase travel speeds sufficiently to increase capacity along the bus route such that the project's impacts along the route would be determined to be less than significant. Increased speeds could be accomplished by funding a portion of the planned bus rapid transit system along 16th Street for the 22 Fillmore between Church and Third streets. Adding signals on Pennsylvania Street and 22nd Street may serve to provide increased travel speeds on this relatively short segment of the bus routes. The project sponsors' contribution may not be adequate to fully achieve the capacity increases needed to reduce the project's impacts and SFMTA may need to secure additional sources of funding.

- Another option to increase capacity along the corridor is to add new a Muni service route in this area. If this option is selected, project sponsors shall fund purchase of the same number of new vehicles outlined in the first option (four for the Maximum Residential Alternative and six for the Maximum Commercial Alternative) to be operated along the new route. By providing an additional service route, a percentage of the current transit riders on the 48 Quintara/24th Street would likely shift to the new route, lowering the capacity utilization below the 85 percent utilization threshold. As for the first option, funding would need to be secured to pay for operating the new route.

Implementing any of the components of Mitigation Measure TR-1 would allow Muni to maintain transit headways, and would reduce the Proposed Project's impact to less-than-significant levels. Implementation of features of the mitigation measure above that would require discretionary approval actions by the SFMTA or other public agencies (including allocation of funds to operate increased frequencies) is considered uncertain because public agencies subject to CEQA cannot commit to implementing any part of a proposed project, including proposed mitigation measures, until environmental review is complete. Thus, while the SFMTA has reviewed the feasibility of the options listed above, implementation of these measures cannot be assured until after certification of the Proposed Project's environmental review. Because it is unknown whether Mitigation Measure TR-1 would be implemented, project-related impacts on the 48 Quintara/24th Street would be **significant and unavoidable**.

As noted in the Mitigation Measure language, based on the thresholds and the effective transit trip generation rates, the Project Sponsor would be required by the Planning Department to demonstrate with each building application whether the transit trips generated by the land use cumulatively proposed as a result of that application would cause any of the trip generation thresholds to be met, and if so, to provide the capital costs for the additional buses prior to occupancy of buildings within that application.

Alternatively, the Project Sponsor may demonstrate that transit trip generation is occurring at a lower rate than originally predicted through counts and/or employee and residential surveys. If transit trip generation is shown to be lower than estimated by the EIR calculations, mitigations can be delayed until warranted based on the observed rates and trips. The total trip generation thresholds would remain the same. The City (the Planning Department and/or the SFMTA) would need to approve on the transit trip generation methodology prior to the Project Sponsor conducting the surveys.

9.3 PEDESTRIAN

Potential Measure TR-2 (RES/COM): Queue Abatement

As a potential measure to minimize the vehicle queues at the Proposed Project driveway into the public right-of-way, the Proposed Project should be subject to the Planning Department's vehicle queue abatement Conditions of Approval (see **Appendix F**).

Abatement methods could include improving on-site vehicle circulation or on-site queuing capacity, employing parking attendants, using "LOT FULL" signs, using parking occupancy sensors and signage directing drivers to available spaces, or time-of-day parking surcharges.

Mitigation Measure TR-3 (RES/COM): Improve Pedestrian Facilities at Adjacent Streets to Project

As part of construction of the Proposed Project roadway network, the project sponsors shall fund the following improvements:

- Install ADA curb ramps on all corners at the intersection of 22nd Street and Illinois Street
- Signalize the intersections of Illinois Street with 20th and 22nd streets.
- Modify the sidewalk on the east side of Illinois Street between 22nd and 20th streets to a minimum of 10 feet. Relocate obstructions, such as fire hydrants and power poles, as feasible, to ensure an accessible path of travel is provided to and from the Proposed Project.

Implementation of Mitigation Measure TR-3 would reduce the Proposed Project's impact to site pedestrian access to **less than significant with mitigation**.

9.4 BICYCLE

No significant environmental impacts have been identified. No mitigation required.

9.5 LOADING

Mitigation Measure TR-4A: Coordinate Deliveries

The Project's Transportation Coordinator shall coordinate with building tenants and delivery services to minimize deliveries during AM and PM peak periods.

Although many deliveries cannot be limited to specific hours, the Transportation Coordinator should work with tenants to find opportunities to consolidate deliveries and reduce the need for peak period deliveries, where possible.

Mitigation Measure TR-4B: Monitor loading activity and convert general purpose on-street parking spaces to commercial loading spaces, as needed.

After completion of the first phase of the Proposed Project, and prior to approval of each subsequent phase, the project sponsors shall conduct a study of utilization of on- and off-street commercial loading spaces. The methodology for the study shall be reviewed and approved by the Planning Department prior to completion. If the result of the study indicates that fewer than 15 percent of the commercial loading spaces are available during the peak loading period, the project sponsors shall incorporate

measures to convert existing or proposed general purpose on-street parking spaces to commercial parking spaces in addition to the required off-street spaces.

Implementation of Mitigation Measures TR-4A and TR-4B may not fully resolve the loading shortfall, as the project's Transportation Coordinator may not be able to shift on-site delivery times. Additionally, there may not be an adequate supply of on-street general purpose parking spaces to convert to commercial loading spaces such that the loading shortfall can be accommodated on-street. Thus, even with implementation of Mitigation Measures TR-4A and TR-4B, the Proposed Project's loading impacts would remain significant and unavoidable.

9.6 EMERGENCY ACCESS

Potential Measure TR-5: Strategies to Enhance Transportation Conditions During Events.

The project's Transportation Coordinator should participate as a member of the Mission Bay Ballpark Transportation Coordination Committee (MBBTCC) and provide at least 1-month notification prior to the start of any event that would overlap with an event at AT&T Park. The City and the project sponsors should meet to discuss transportation and scheduling logistics for occasions with multiple events in the area.

9.7 CONSTRUCTION

No significant environmental impacts have been identified. No mitigation required; however, a potential measure was identified.

Potential Measure TR-6 (RES/COM): Construction Management

Traffic Control Plan for Construction – In order to reduce potential conflicts between construction activities and pedestrians, bicyclists, transit, and autos during construction activities, the Project applicant shall require construction contractor(s) to prepare a traffic control plan for major phases of Proposed Project construction (e.g. demolition, construction, or renovation of individual buildings). The Project applicant and their construction contractor(s) will meet with relevant City agencies to coordinate feasible measures to reduce traffic congestion, including temporary transit stop relocations and other measures to reduce potential traffic and transit disruption and pedestrian circulation effects during major phases of construction. For any work within the public right-of-way, the contractor would be required to comply with the City of San Francisco's Regulations for Working in San Francisco Streets, which establish rules and permit requirements so that construction activities can be done safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicular traffic. Additionally, non-construction-related truck movements and deliveries shall be limited to the maximum feasible extent during peak hours (generally 7 to 9 AM and 4 to 6 PM, or other times, as determined by SFMTA and its Transportation Advisory Staff Committee [TASC]).

In the event that the construction timeframes of the major phases and other development projects adjacent to the Proposed Project site overlap, the Project applicant should coordinate with City Agencies through the TASC and the adjacent developers to minimize the severity of any disruption to adjacent land uses and transportation facilities from overlapping construction transportation impacts. The Project applicant, in conjunction with the adjacent developer(s), shall propose a construction traffic control plan that includes measures to reduce potential construction traffic conflicts, such as coordinated material drop offs, collective worker parking and transit to job site and other measures.

Reduce SOV Mode Share for Construction Workers – In order to minimize parking demand and vehicle trips associated with construction workers, the Project applicant shall require the construction contractor to include in the Traffic Control Plan for Construction methods to encourage walking, bicycling, carpooling, and transit access to the campus sites by construction workers in the coordinated plan.

Project Construction Updates for Adjacent Residents and Businesses – In order to minimize construction impacts on access for nearby residences, institutions, and businesses, the Project applicant shall provide nearby residences and adjacent businesses with regularly-updated information regarding Proposed Project construction, including construction activities, peak construction vehicle activities (e.g., concrete pours), travel lane closures, and lane closures via a newsletter and/or website.

9.8 PARKING

No significant environmental impacts have been identified; no mitigation required.

9.9 CUMULATIVE CONDITIONS

Potential Measure TR-7 (RES/COM): Strategies to Enhance Transportation Conditions During Events

The Project Sponsor should participate as a member of the MBBTCC and provide at least one month notification prior to the start of any event that would overlap with an event at the Warriors arena. The City and the Project Sponsor should meet to discuss transportation and scheduling logistics for occasions with multiple events in the area. Less-than-significant transportation impacts caused by events would be further reduced by this potential measure.

Mitigation Measure TR-8 (RES): Increase Bus Service Capacity for SFMTA (Cumulative)

If Mitigation Measure TR-1 is implemented, and the option of increasing the number of buses operating on the route is selected as the preferred approach, the project sponsors shall purchase one additional vehicle (in addition to the four prescribed under Mitigation Measure TR-1), for a total of five, to reduce the Proposed Project's contribution to the significant cumulative impact to not considerable.

Because the City cannot guarantee that these additional buses would be allocated to this specific route, the City cannot guarantee that supply would increase to meet the projected demand even with mitigation, and the impact would remain **significant and unavoidable with mitigation**.

As mentioned, the Proposed Project would be built out over many years and has a flexible land use development program, and not all of the mitigation measures are needed at the outset of development. As a result, transit capacity and transit trip generation shall be monitored over time to determine whether the impacts materialize to the extent predicted.

Based on the thresholds and the effective transit trip generation rates, the Project Sponsor would be required by the Planning Department to demonstrate with each building application whether the transit trips generated by the land use cumulatively proposed as a result of that application would cause any of the trip generation thresholds to be met, and if so, to provide the capital costs for the additional buses prior to occupancy of buildings within that application.

The T Third Outbound is projected to operate at 101 percent capacity without the Proposed Project in the AM peak hour, and the Proposed Project would add less than five percent to the route under both the Maximum Residential

and Maximum Commercial scenarios. Therefore, although there will be a significant cumulative impact on this route because the route would operate above the 85 percent capacity utilization threshold, the Proposed Project's contribution is less than five percent and is considered **not considerable**.

9.10 POTENTIAL MEASURES FROM INTERSECTION AND FREEWAY OPERATIONS ANALYSIS

In January 2016, the State of California Office of Planning and Research (OPR) published for public review and comment a *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* recommending that transportation impacts for projects be measured using a vehicle miles traveled (VMT) metric. On March 3, 2016, in anticipation of the future certification of the revised CEQA Guidelines, the San Francisco Planning Commission adopted OPR's recommendation to use the VMT metric instead of automobile delay to evaluate the transportation impacts of projects (Resolution 19579). The VMT metric does not apply to the analysis of impacts on non-automobile modes of travel such as riding transit, walking and bicycling. Automobile delay information is still presented in Chapter 7 for informational purposes only.

Under the CEQA significance criteria formerly used by the San Francisco Planning Department (2002 *San Francisco Transportation Impact Analysis Guidelines for Environmental Review* (SF Guidelines)), level of service (LOS) is a criterion used to assess whether a proposed project would result in significant impacts. The analysis was conducted for this Proposed Project to help identify locations for potential infrastructure improvements. Potential improvements are noted for each location that incurs what would previously have been designated a significant impact based on the 2002 criteria. A discussion of their feasibility is included in Chapter 7, and if the potential measure has been identified to move forward, the responsible party and the Project Sponsor's share of the potential cost is noted. The potential measures are the same for the Maximum Residential Scenario and Maximum Commercial Scenario.

Potential Measure TR-9: Convert Existing Signal at 20th Street / Illinois Street from All-Way Stop Operation (Flashing Red) to Conventional Signal Operation

To improve poor operating conditions at the intersection, the SFMTA could operate a signal at this intersection, which currently operates in "flashing red" mode, signalizing an all-way stop, to be a conventional signal. With this change, this intersection would continue to operate unacceptably in the AM and PM peak hours, though operations would be improved. The Project Sponsor shall pay their fair share of the cost to install this potential measure.

Potential Measure TR-10: Install and Operate Signal at 21st Street / Illinois Street

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate at LOS F in the AM and PM peak hours, though operations would be improved. The Project Sponsor shall pay their fair share of the cost for this potential measure.

Potential Measure TR-11: Install and Operate Signal at 22nd Street / Illinois Street

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would continue to operate at LOS F in the AM and PM peak hours, though operations would be improved. The Project Sponsor shall pay their fair share of the cost for this potential measure.

Potential Measure TR-12: Install and Operate Signal at 25th Street / Indiana Street / I-280 Northbound On-Ramp

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B or better during both peak hours. The Project Sponsor shall pay their fair share of the cost for this potential measure.

Potential Measure TR-13: Install and Operate Signal at 25th Street / Pennsylvania Street

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would improve to acceptable LOS B in the AM peak hour. However, the intersection would still operate at LOS F in the PM peak hour. The Project Sponsor shall pay their fair share of the cost for this potential measure.

Potential Measure TR-14: Install and Operate Signal at Pennsylvania Street / I-280 Southbound Off-Ramp

To improve poor operating conditions at the intersection, the SFMTA could install and operate a signal at this intersection. With signalization, this intersection would operate at LOS B in the PM peak hour. The Project Sponsor shall pay their fair share of the cost for this potential measure.

APPENDIX C: NOISE TECHNICAL MEMORANDUM

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Final
Noise Technical Memorandum

Pier 70 Mixed-Use District Project
San Francisco, California

Case No. 2014-001272ENV

Prepared for
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December 2016

★ ★ ★

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Noise Technical Memorandum (Final)

Date December 17, 2016

To Melinda Hue, Environmental Planning, San Francisco Planning Department

From Valerie Chew Geier, Senior Associate

Subject Pier 70 Mixed-Use District Project

INTRODUCTION AND PURPOSE

This memorandum presents the results of noise measurements to characterize the existing noise environment in the Pier 70 Mixed-Use District Project site and discussion of the project's noise compatibility with the existing and future noise environment. This document is prepared in support of the Pier 70 Mixed-Use District Project EIR.

The proposed Pier 70 Mixed-Use District project site is an approximately 35-acre area bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. The majority of the project site is located within the Pier 70 area (Pier 70), which is owned by the City and County of San Francisco through the Port of San Francisco (Port). Two development areas constitute the project site. The "28-Acre Site" is an approximately 28-acre site located between 20th Street, Michigan Street, 22nd Street, and San Francisco Bay. The "Illinois Parcels" form an approximately 7-acre site that consists of an approximately 3.4-acre Port-owned parcel, called the 20th/Illinois Parcel, along Illinois Street at 20th Street and an approximately 3.6-acre parcel, called the Hoedown Yard, at Illinois and 22nd streets, which is owned by PG&E; the Hoedown Yard includes a 0.2-acre portion of street right-of-way that bisects the site, and is owned by the City.

PROJECT DESCRIPTION

The Proposed Project would include amendments to the General Plan and Planning Code, adding a Pier 70 Special Use District, which would establish land use controls for the project site and incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development* document. As envisioned, the proposed Pier 70 Mixed-Use District Project (Proposed Project) would include market-rate and affordable residential uses, commercial use, retail, arts, light-industrial (RALI) uses,[1] parking, shoreline improvements, infrastructure development and street improvements, and public open space.

[1] The project sponsors describe the RALI use as including neighborhood-serving retail, arts, eating and drinking places, production distribution and repair, light manufacturing, and entertainment establishments.

Under the provisions of the proposed Pier 70 Special Use District, the Proposed Project would provide a mixed use land use program. To cover a full range of potential land uses that could be developed under the Proposed Project, the EIR analyzes a maximum residential-use scenario (Maximum Residential Scenario) and a maximum commercial-use scenario (Maximum Commercial Scenario) for the project site, which will bracket specific maximum ranges of uses that could be developed.

For the 28-Acre Site, up to a maximum of approximately 3,442,265 gross square feet (gsf) of construction in new buildings and improvements to existing structures[2] could be constructed. Development of the Illinois Parcels would include up to a maximum of approximately 801,400 gsf in new buildings. Under both scenarios, two parcels (C1 and C2) on the project site that would be designated for district-structured parking could be developed with residential/commercial uses or residential use, depending on future market demand. Specifically, Parcel C1 could be developed with residential, commercial, or parking uses, and Parcel C2 could be developed with residential or parking uses. Active or passive public rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on the roof of both of these parcels under both scenarios as well if the parcels are built as district parking structures. Accessory, surface and below grade parking would be allowed on all parcels on the 28-Acre Site except Buildings 2, 12, and 21 and Parcel E4. These buildings would be renovated and converted into commercial, RALI, or residential uses. RALI uses would be allowed on the ground-floor levels of all future buildings on Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, H2, PKN, PKS, HDY1, and HDY2. Building 2 would allow either commercial or residential uses, with RALI allowed on the ground floor. Buildings 12 and 21 as well as Parcel E4 would allow RALI only with commercial allowed on the upper floor. On the Illinois Parcels, retail/restaurant uses would be allowed on the ground floor, while accessory parking would be allowed on all four parcels. No residential uses would be allowed on the ground floor of PKN.

Open spaces programmed as part of the Proposed Project are anticipated to accommodate public outdoor events, including art exhibitions, theater performances, cultural events, outdoor fairs, festivals and markets, outdoor film screenings, evening/night markets, food events, street fairs, and lecture services. Fewer than 100 events per year are anticipated, including approximately 25 mid-size events attracting attendance between 500 to 750 people, and four larger-size events attracting up to 5,000 people.

The Maximum Residential Scenario and the Maximum Commercial Scenario for both the 28-Acre Site and the Illinois Parcels are mutually exclusive: the maximum commercial and maximum residential programs could not both be built. If the Proposed Project were to be built with the maximum amount of commercial space, less space would be developed with residential uses, and conversely, if the maximum number of residential units were constructed, less space would be developed with commercial uses as described below. Depending on the uses developed, the Proposed Project's total gsf would range between a maximum of 4,212,230 gsf, under the Maximum Residential Scenario, to 4,179,300 gsf, under the Maximum Commercial Scenario, excluding square footage associated with accessory and district parking.

[2] Excluding basement-level square footage allocated to accessory and district parking.

Total construction on the 28-Acre Site would not exceed a maximum of 3,422,265 gsf, and a maximum of 801,400 gsf on the Illinois Parcels.

Maximum Residential Scenario

Figure 1: Illustrative Phased Site Plan – Maximum Residential Scenario, presents the proposed land uses and possible phasing for each parcel in the Pier 70 Mixed-Use District Project site. **Table 1, Project Summary Table by Parcel**, lists proposed uses, height limits, and whether new construction or building rehabilitation (by parcel) is proposed under the Maximum Residential Scenario.

28-Acre Site

Development under the Maximum Residential Scenario on the 28-Acre Site would include a maximum of up to 3,410,830 gsf in new and renovated buildings. Under this scenario, there would be up to 2,150 residential units (up to approximately 710 studio/one-bedroom units and 1,440 two- or more bedroom units), totaling about 1,870,000 gsf, as well as approximately 1,095,650 gsf of commercial space and 445,180 gsf of RALI space (241,655 gsf of retail space, 60,415 gsf of restaurant space, and 143,110 gsf of arts/light-industrial space). The overall development envelope includes rehabilitation, in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, of 237,800 gsf in Buildings 2, 12, and 21. For this analysis, the flexible-use parcels (Parcels F, G, H1, and H2) are assumed to be devoted to residential use, and Parcels C1 and C2 would be built as residential use in order to study the maximum gsf of development area on the project site under the Maximum Residential Scenario.

Illinois Parcels

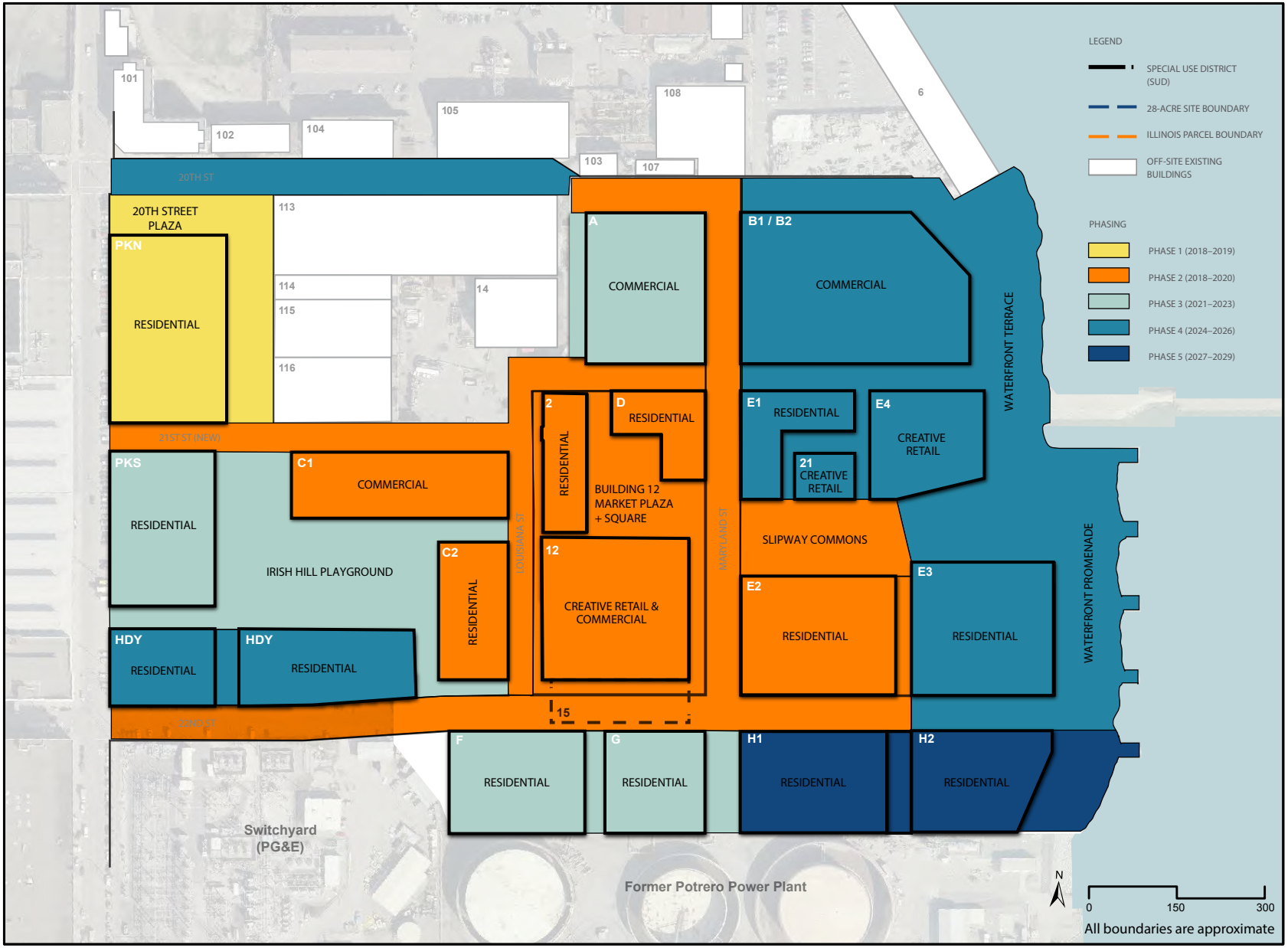
Development under the Maximum Residential Scenario on the Illinois Parcels would include a maximum of up to 801,400 gsf in newly constructed buildings. Under this scenario, there would be up to 875 residential units (up to approximately 290 studio/one-bedroom units and 585 two- or more bedroom units) totaling about 760,000 gsf, as well as approximately 6,600 gsf of commercial area and approximately 34,800 gsf of retail/restaurant space (27,840 gsf of retail space and 6,960 gsf of restaurant space) in new buildings.

Maximum Commercial Scenario

Figure 2, Illustrative Phased Site Plan – Maximum Commercial Scenario, presents the proposed land uses and possible phasing for each parcel in the Pier 70 Mixed-Use District Project site. Table 1, Project Summary Table by Parcel, lists proposed uses, height limits, and whether new construction or building rehabilitation (by parcel) is proposed under the Maximum Commercial Scenario.

28-Acre Site

Development on the 28-Acre Site under the Maximum Commercial Scenario would include a maximum of up to about 3,422,265 gsf in new and renovated buildings. Under this scenario, there would be up to 1,100 residential units (up to approximately 365 studio/one-bedroom units and 735 two- or more bedroom units) totaling about 957,000 gsf, as well as approximately 2,024,050 gsf of commercial area, and



SOURCE: FOREST CITY

FIGURE 1: ILLUSTRATIVE PHASED SITE PLAN - MAXIMUM RESIDENTIAL SCENARIO

Table 1: Project Summary Table by Parcel

Project Parcel/ Building	Max Res Scenario Proposed Use	Max Com Scenario Proposed Use	Maximum Height (feet)	Building Rehabilitation	New Construction
28-Acre Site[1]					
Parcel A	Commercial	Commercial	90		X
Parcel B	Commercial	Commercial	90		X
	Commercial	Commercial	90		X
Parcel C1[2]	Residential / Parking (rooftop open space)	Commercial / Parking (rooftop open space)	90		X
Parcel C2[2]	Residential / Parking (rooftop open space)	Residential / Parking (rooftop open space)	90		X
Parcel D	Residential	Residential	90		X
Parcel E1	Residential	Residential	90/65[3]		X
Parcel E2	Residential	Residential	70		X
Parcel E3	Residential	Residential	70		X
Parcel F	Residential	Commercial	90		X
Parcel G	Residential	Commercial	90		X
Parcel H1	Residential	Commercial	90		X
Parcel H2	Residential	Commercial	90		X
Building 2	Residential	Commercial	No Change	X	
Parcel E4	RALI	RALI	50		X
Building 12	RALI	RALI	No Change	X	
Building 21	RALI	RALI	No Change	X	
Illinois Parcel[4]					
20th/Illinois Parcels (PKN & PKS)	Residential	Residential	65		X
Hoedown Yard (HDY1 & HDY2)	Residential	Commercial	65		X

Notes:

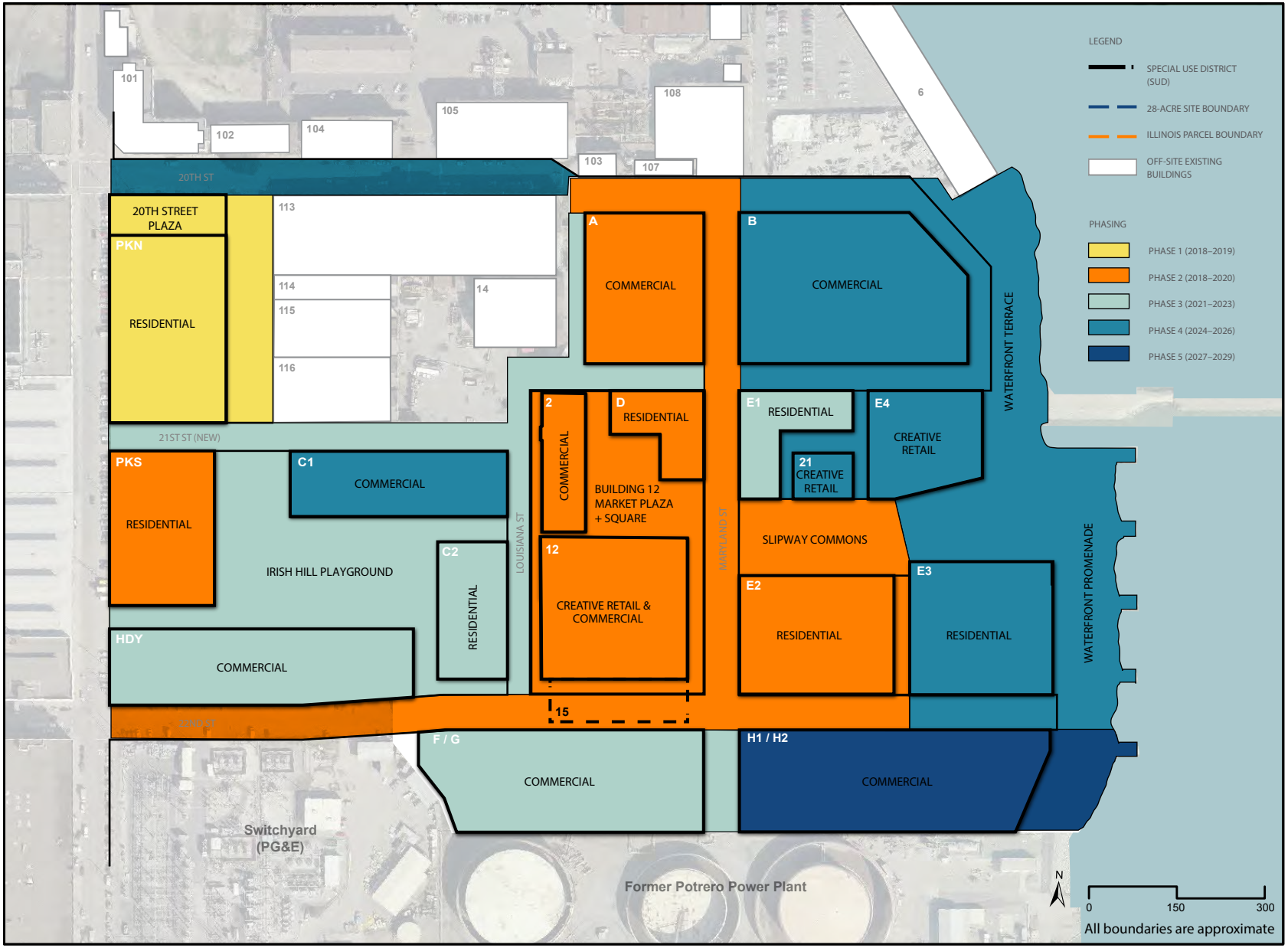
1 All 28-Acre Site parcels except existing Buildings 2, 12, and 21 would be permitted to include parking as an accessory use (both within building floors or under buildings). Buildings 2, 12, and 21 on the 28-Acre Site would be renovated and converted into commercial, RALI, or residential uses. Also RALI uses would be on the ground-floor levels of all future buildings on Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, H2, PKN, PKS, HDY1, HDY2 and Buildings 2 and 12. Parcel E4 and Building 21 would contain only RALI uses.

2 Under both scenarios, Parcel C1 could be developed with residential, commercial, or parking uses and Parcel C2 could be developed with residential or parking uses. Active public rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on the roof of both of these parcels under both scenarios as well, if the parcels are built as district parking structures.

3 The maximum height is 65 feet under the Maximum Commercial scenario.

4 Retail/Restaurant uses would be allowed on the ground floor and accessory parking would be allowed on all four parcels.

Source: Forest City; Turnstone / SWCA



SOURCE: FOREST CITY

FIGURE 2: ILLUSTRATIVE PHASED SITE PLAN - MAXIMUM COMMERCIAL SCENARIO

441,215 gsf of RALI space (238,485 gsf of retail space, 59,620 gsf of restaurant space, and 143,110 gsf of arts/light-industrial space). The overall development envelope includes the rehabilitation, in compliance with the Secretary of the Interior's Standards for Treatment of Historic Properties, of 227,800 gsf in Buildings 2, 12, and 21. As noted above, the flexible land use program contemplates two parcels, Parcels C1 and C2, which may be developed for parking, residential or commercial-office use depending on future market demand and future transportation network changes. Under this scenario, flexible-use parcels (Parcels F, G, H1, H2, and C1 and Building 2) would be developed as commercial use and that Parcel C2 would be developed as residential use in order to study the maximum gsf of development area on the project site under this Maximum Commercial Scenario.

Illinois Parcels

Development on the Illinois Parcels under the Maximum Commercial Scenario would include a maximum of about 757,035 gsf in new buildings. Under this scenario, there would be up to 545 residential units (up to approximately 180 studio/one-bedroom units and 365 two-or-more bedroom units) totaling about 473,000 gsf, as well as approximately 238,300 gsf of commercial area and approximately 45,735 gsf of retail/restaurant space (36,590 gsf of retail space and 9,145 gsf of restaurant space) in new buildings.

Proposed Construction Phasing

For both development scenarios, the Maximum Residential Scenario and the Maximum Commercial Scenario, Proposed Project construction is conceptual; however it is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve up to five phases, designated as Phases 1, 2, 3, 4, and 5; phasing estimates are shown in **Table 2: Project Construction and Rehabilitation Phasing for the Maximum Residential Scenario, Figure 3: Proposed Phasing Plan - Maximum Residential Scenario, Table 3: Project Construction and Rehabilitation Phasing for the Maximum Commercial Scenario, and Figure 4: Proposed Phasing Plan - Maximum Commercial Scenario**. These phases are subject to change, but would occur within an approximately 11-year period and within the maximum development ranges presented in the two scenarios.

Infrastructure improvements (utilities, streets and open space) and grading and excavation activities would be constructed by Forest City, as master developer, and would occur in tandem, as respective and adjacent parcels are developed. Vertical development on the various parcels could be constructed by Forest City, or by third party developers.

SOUND FUNDAMENTALS

Sound is characterized by various parameters that describe the rate of oscillation (frequency) of sound waves, the distance between successive troughs or crests in the wave, the speed that it travels, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by over one million times within

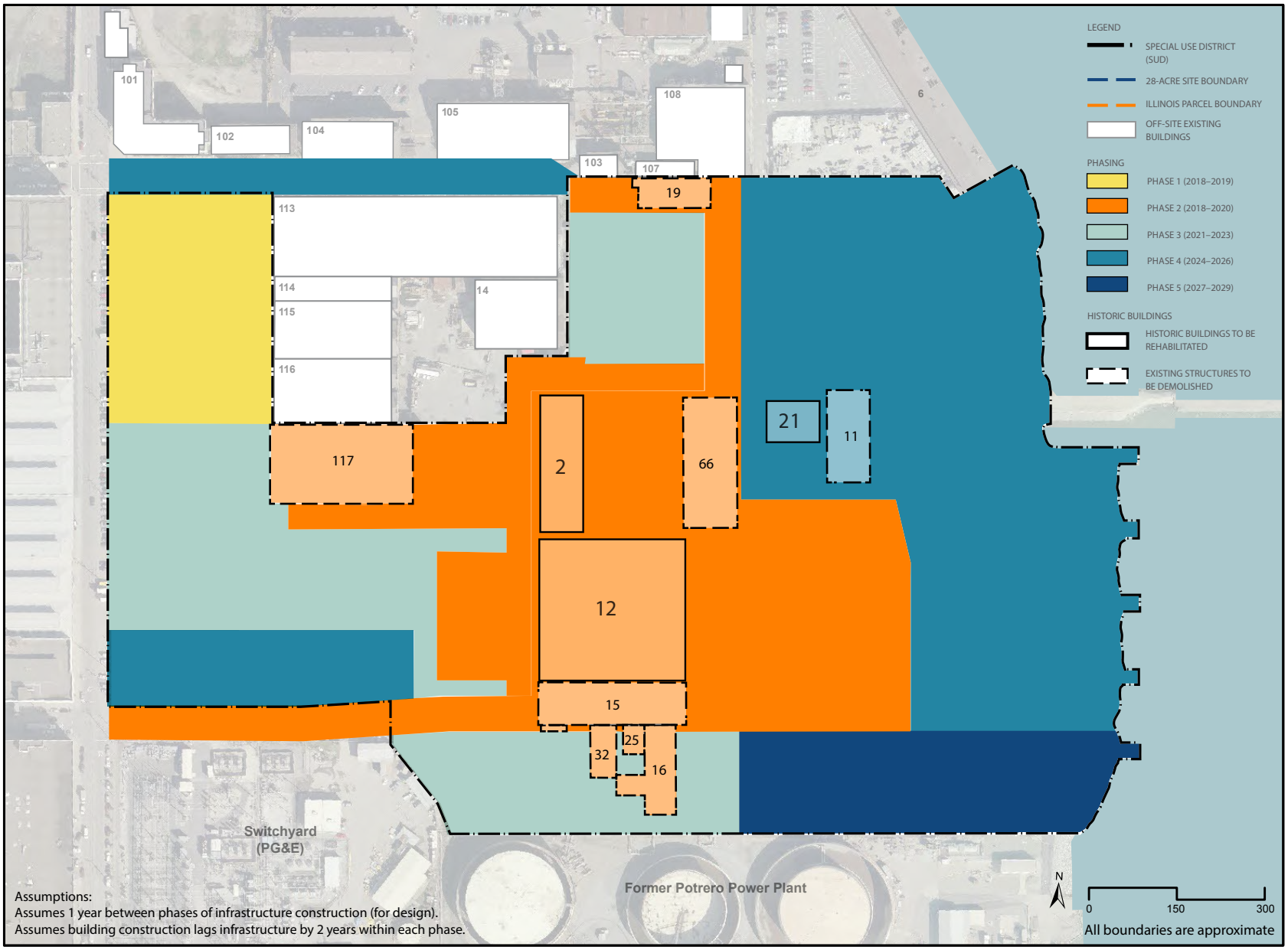
Table 2: Project Construction and Rehabilitation Phasing for the Maximum Residential Scenario

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (gsf /No. of Residential Units)	Commercial (gsf)	RALI (gsf)		
Phase 1 (2018-2019)	28-Acre Site						
	Illinois Parcels	PKN	261,700 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new), 20th Street Pump Station (new)
Phase 2 (2018-2020)	28-Acre Site	Building 2*, Parcel C1, Parcel C2, Parcel D, Parcel E2	578,250 / 662 units	221,100	52,035	Building 12 Market Plaza Market Square Slipway Commons (western portion)	20th Street (new/central portion) 21st Street (new/eastern portion) 22nd Street (existing and new) Louisiana Street (new/southern portion) Maryland Street (new/northern portion)
		Building 12*		60,000	105,500		
	Illinois Parcels						
Phase 3 (2021-2023)	28-Acre Site	Parcel A, Parcel F, Parcel G	436,100 / 505 units	288,200	57,270	Irish Hill Playground	Maryland Street (new/southern portion [continued from Phase 2])
	Illinois Parcels	PKS	213,100 / 240 units		11,000		
Phase 4 (2024-2026)	28-Acre Site	Parcel E1, Parcel E3, Parcel E4, Parcel B	378,600 / 436 units	526,350	189,675	Slipway Commons (eastern portion [continued from Phase 3]) Waterfront Terrace Waterfront Promenade (northern portion)	20th Street (western and eastern portions [continued from Phase 2]) 21st Street (eastern portion [continued from Phase 2]) 22nd Street (eastern portion [continued from Phase 2])
		Building 21*			10,200		
	Illinois Parcels	Parcel HDY1, Parcel HDY2	285,200 / 335 units		17,200		
Phase 5 (2027-2029)	28-Acre Site	Parcel H1, Parcel H2	477,050 / 547 units		40,700	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
Total			2,630,000 / 3,025 units	1,102,250	479,980		

Notes:

* = denotes an existing building that would be rehabilitated under the Proposed Project.

Source: Forest City; Turnstone / SWCA



SOURCE: FOREST CITY

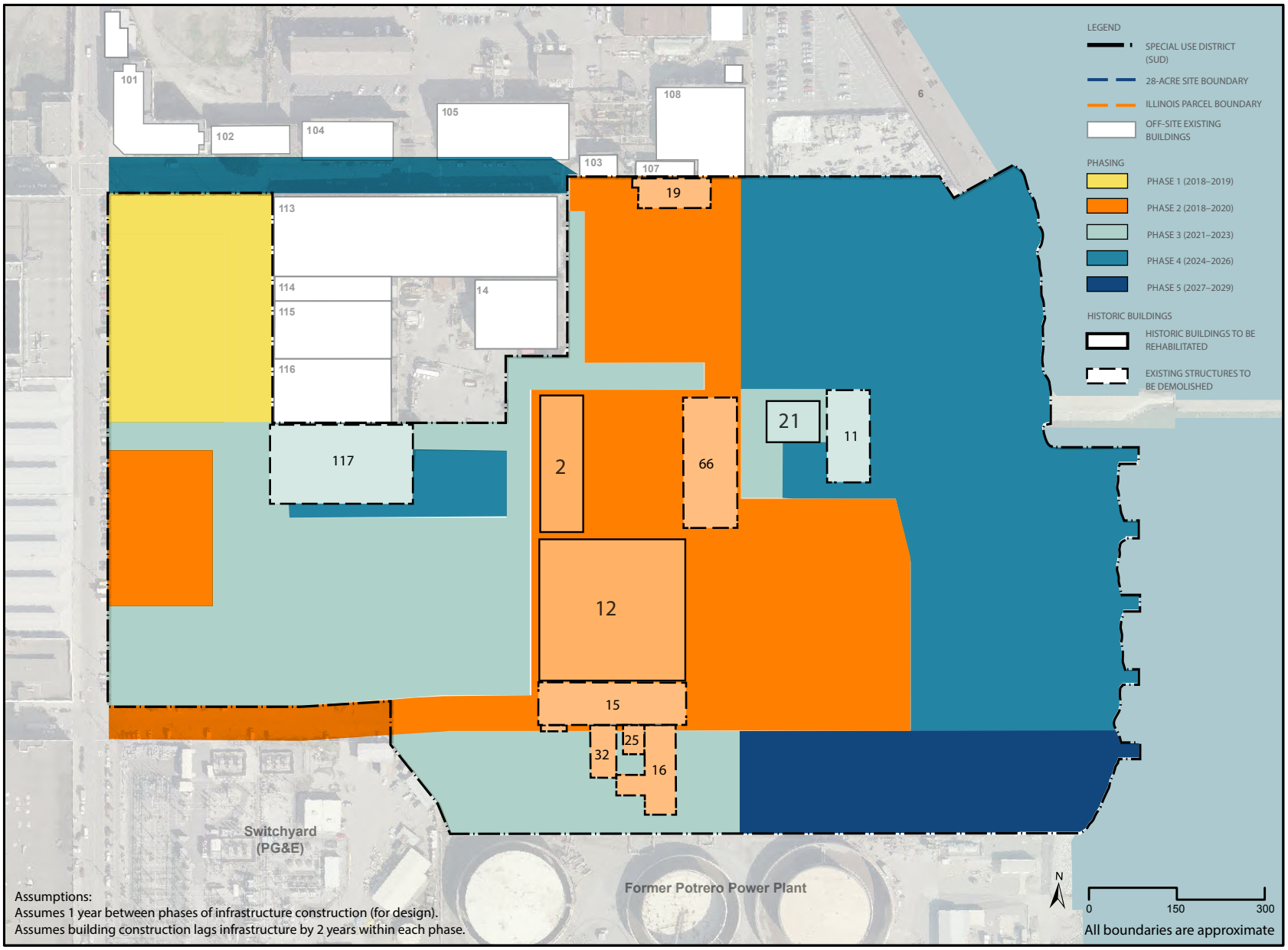
FIGURE 3: PROPOSED PHASING PLAN - MAXIMUM RESIDENTIAL SCENARIO

Table 3: Project Construction and Rehabilitation Phasing for the Maximum Commercial Scenario

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (gsf/No. of Residential Units)	Commercial (gsf)	RALI (gsf)		
Phase 1 (2018-2019)	*28-Acre Site*						
	Illinois Parcels	PKN	260,500 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new), 20th Street Pump Station (new)
Phase 2 (2018-2020)	*28-Acre Site*	Parcel A, Parcel D, Parcel E2, Building 2*	389,400 / 445 units	348,200	97,400	Building 12 Market Plaza Market Square Slipway Commons (western portion)	20th Street (new/central portion) 22nd Street (existing and new) Maryland Street (new/northern portions)
		Building 12*			52,720		
	Illinois Parcels	PKS	215,500 / 245 units		11,000		
Phase 3 (2021-2023)	*28-Acre Site*	Parcel C2, Parcel E1, Parcel F, Parcel G	325,350 / 375 units	442,200	57,620	Irish Hill Playground	21st Street (new/eastern portion) Louisiana Street (new) Maryland Street (new/southern portion [continued from Phase 2])
	Illinois Parcels	Parcel HDY1, Parcel HDY2		231,700	28,135		
Phase 4 (2024-2026)	*28-Acre Site*	Parcel B, Parcel C1, Parcel E3,	242,250 / 280 units	747,450	85,505	Slipway Commons (eastern portion [continued from Phase 2]) Waterfront Terrace Waterfront Promenade (northern portion)	20th Street (western and eastern portions [continued from Phase 2]) 21st Street (western portion [continued from Phase 3]) 22nd Street (eastern portion [continued from Phase 2])
		Building 21*, Parcel E4			110,400		
	Illinois Parcels						
Phase 5 (2027-2029)	*28-Acre Site*	Parcel H1, Parcel H2		486,200	37,570	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
Total			**1,433,000 / 1,645 units**	**2,262,350**	**486,950**		

Notes:
* = denotes an existing building that would be rehabilitated under the Proposed Project.

Source: Forest City; Turnstone / SWCA



SOURCE: FOREST CITY

FIGURE 4: PROPOSED PHASING PLAN - MAXIMUM COMMERCIAL SCENARIO

the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. Except in carefully controlled laboratory experiments, a change of only 1 dBA in sound level cannot be perceived. Outside of the laboratory, a 3-dBA change is considered a perceptible difference. A 10-dBA increase in the level of a continuous noise represents a perceived doubling of loudness.[3]

Noise Descriptors

Noise is generally defined as sound that is loud, disagreeable, unexpected or unwanted. Sound is mechanical energy transmitted in the form of a wave by a disturbance or vibration that causes pressure variation in air is detectable by the human ear\. Variations in noise exposure over time are typically expressed in terms of a steady-state energy level (called L_{eq}) that represents the acoustical energy of a given measurement, or alternatively as a statistical description of what sound level is exceeded over some fraction (10, 50 or 90 percent) of a given observation period (i.e., $L_{10,}$ L_{50}, L_{90}). L_{eq} (24) is the steady-state acoustical energy level measured over a 24-hour period. L_{max} is the maximum, instantaneous noise level registered during a measurement period. Because residential receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires for planning purposes that an artificial dBA increment be added to evening and nighttime noise levels to form a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). CNEL adds a 5-dBA penalty during the evening (7 p.m. to 10 p.m.) and a 10-dBA penalty at night (10 p.m. to 7 a.m.). Another 24-hour noise descriptor, called the day-night noise level (L_{dn}), is similar to CNEL. Both CNEL and L_{dn} add a 10-dBA penalty to all nighttime noise levels between 10 p.m. and 7 a.m., but L_{dn} does not add the evening 5-dBA penalty between 7 p.m. and 10 p.m. In practice, L_{dn} and CNEL usually differ by less than 1 dBA at any given location from transportation noise sources.[4] **Table 4, Representative Environmental Noise Levels,** presents representative noise sources and their corresponding noise levels in dBA at varying distances from the noise sources.

Noise from Multiple Sources

Since sound pressure levels in decibels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. Adding a new noise source to an existing noise source, both producing noise at the same level, will not double the noise level. **Table 5, Rules for Combining Sound Levels by "Decibel Addition,"** demonstrates the result of adding noise from multiple sources.

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[3] California Department of Transportation (Caltrans), *Technical Noise Supplement (TeNS) to the Traffic Noise Analysis Protocol,* pp. 2-44 to 2-45, September 2013. Available online at http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf. Accessed April 14, 2015.

[4] Ibid. pp. 2-48.

Table 4: Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 100 feet		
	100	
Gas Lawnmower at 3 feet		
	90	
Diesel Truck going 50 mph at 50 feet		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noise Urban Area during Daytime		
Gas Lawnmower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Area during Daytime	50	Dishwasher in Next Room
Quiet Urban Area during Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	30	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
	0	

Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol,* p. 2-20, September 2013.

Table 5: Rules for Combining Sound Levels by "Decibel Addition"[1]

When two decibel values differ by	Add the following amount to the higher decibel value	Example
0 to 1 dB	3 dB	60 dB + 61 dB = 64 dB
2 to 3 dB	2 dB	60 dB + 63 dB = 65 dB
4 to 9 dB	1 dB	60 dB +69 dB = 70 dB
10 dB or more	0 dB	60 dB + 75 dB = 75 dB

Note:
[1] This methodology provides an estimate of the resulting sound level and is accurate to ±1 decibel.

Source: Orion Environmental Associates, 2016.

If the difference between two noise sources is 10 dBA or more, the higher noise source will dominate and the resultant noise level will be equal to the noise level of the higher noise source. In general, if the difference between two noise sources is 0 to 1 dBA, the resultant noise level will be 3 dBA higher than the higher noise source, or both sources if they are equal. If the difference between two noise sources is 2 to 3 dBA, the resultant noise level will be 2 dBA above the higher noise source. If the difference between two noise sources is 4 to 10 dBA, the resultant noise level will be 1 dBA higher than the higher noise source.

Attenuation of Noise

A receptor's distance from a noise source affects how noise levels attenuate (decrease). Transportation noise sources tend to be arranged linearly such that roadway traffic attenuates at a rate of 3.0 dBA to 4.5 dBA per doubling of distance from the source, depending on the intervening surface (paved or vegetated, respectively). Point sources of noise, such as stationary equipment or construction equipment, typically attenuate at a rate of 6.0 dBA to 7.5 dBA per doubling of distance from the source.[5] For example, a sound level of 80 dBA at 50 feet from the noise source will be reduced to 74 dBA at 100 feet, 68 dBA at 200 feet, and so on. Noise levels can also be attenuated by "shielding" or providing a barrier between the source and the receptor. With respect to interior noise levels, noise attenuation effectiveness depends on whether windows are closed or open. Based on the U.S. Environmental Protection Agency's national average, closed windows reduce noise levels by approximately 25 dBA, while open windows reduce noise levels by about 15 dBA.[6]

Health Effects of Environmental Noise

The World Health Organization (WHO) is perhaps the best source of current knowledge regarding health impacts of noise. According to WHO, sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA (L_{eq}) or when intermittent interior noise levels reach or exceed 45 dBA (L_{max}), particularly if background noise is low. With a bedroom window slightly open (a reduction from outside to inside of 15 dB), the WHO criteria would suggest exterior continuous (ambient) nighttime noise levels should be 45 dBA (L_{eq}) or below, and short-term events should not generate noise in excess of 60 dBA (L_{max}). WHO also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective for the ability to fall asleep.[7]

Other potential health effects of noise identified by WHO include decreased performance on complex cognitive tasks, such as reading, attention, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (again, generally after long-term occupational exposure, or shorter term exposure to very high noise levels, for example, exposure several times a year to concert noise at 100 dBA). Noise can also disrupt speech intelligibility at relatively low levels; for example, in a classroom setting, a noise level as low as 35 dBA can disrupt clear understanding. Finally, noise can cause annoyance, and can trigger emotional reactions like anger, depression, and anxiety. WHO reports that,

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[5] The 1.5 dBA variation in attenuation rate (6 dBA vs. 7.5 dBA) can result from ground-absorption effects, which occur as sound travels over soft surfaces such as soft earth or vegetation (7.5 dBA attenuation rate) versus hard ground such as pavement or very hard-packed earth (6 dBA rate). (U.S. Housing and Urban Development, *The Noise Guidebook*, 1985, p. 24. Available online at https://www.hudexchange.info/onecpd/assets/File/Noise-Guidebook-Chapter-4.pdf. Accessed April 14, 2015.)

[6] U.S. EPA, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. Appendix B, Table B-4, p. B-6. March 1974.

[7] World Health Organization, *Guidelines for Community Noise.* Chapter 3, p. 46. April 1999. Available online at http://www.who.int/docstore/peh/noise/guidelines2.html. Accessed on November 18, 2015.

during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA, or moderately annoyed with noise levels below 50 dBA.

Vehicle traffic and continuous sources of machinery and mechanical noise contribute to ambient noise levels. Short-term noise sources, such as large vehicle audible warnings, the crashing of material being loaded or unloaded, car doors slamming, and engines revving, contribute very little to 24-hour noise levels but are capable of causing sleep disturbance and severe annoyance. The importance of noise to receptors depends on both time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels, if they occur at night, can disturb sleep.

Vibration and Groundborne Noise

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity or acceleration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Vibration is typically measured by peak particle velocity (PPV) in inches per second (in/sec). With the exception of long-term occupational exposure, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. People may tolerate infrequent, short duration vibration levels, but human annoyance to vibration becomes more pronounced if the vibration is continuous or occurs frequently. High levels of vibration can damage fragile buildings or interfere with sensitive equipment. Depending on the age of the structure and type of vibration (transient, continuous or frequent intermittent sources), vibration levels can range between 0.1 to 2.0 in/sec PPV for damage to a structure.[8]

Typical sources of groundborne vibration in San Francisco are large-scale construction projects that involve pile driving or underground tunneling, Vibration is also caused by operation of transit vehicles in the subway system under Market Street (including Muni and Metro light rail vehicles and heavy rail Bay Area Rapid Transit (BART) trains. In general, such vibration is only an issue when sensitive receptors are located in close proximity. Since rubber tires provide vibration isolation, rubber tire vehicles, such as Muni buses, trucks, and automobiles, rarely create substantial groundborne vibration effects unless there is a discontinuity or bump in the road that causes the vibration.[9]

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[8] California Department of Transportation (Caltrans), *Transportation and Construction Vibration Guidance Manual*, September 2013, Table 9, p. 23. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed on December 16, 2016.

[9] FTA, 2006. *Transit Noise and Vibration Impact Assessment,* DTA-VA-90-1003-06, p. 10-6. May 2006. U.S. Department of Transportation. Available online at http://www.fta.dot.gov/12347_2233.html. Accessed April 14, 2015.

EXISTING CONDITIONS

Noise

The Pier 70 Mixed-Use District project site is bounded by Illinois Street to the west, 20th Street to the north, the San Francisco Bay to the east, and 22nd Street to the south. The project site is located in an urban area where noise from nearby industrial uses (including BAE Shipyard repair facilities to the north and the American Industrial Center (AIC) to the west) and vehicular traffic (autos, trucks and buses on the I-280 freeway and other streets in the vicinity) dominate the existing ambient noise environment. In addition, intermittent sources of noise that contribute to ambient noise levels include distant commuter train traffic (Caltrain) approximately ¼ mile to the west and nearby light rail trains (Third Street line) approximately 365 feet west of the Project's western boundary. More distant intermittent noise sources include activities such as concerts at AT&T Ballpark, which is located 1¼ mile north of the site. Principal noise sources in the immediate project vicinity are described as follows:

- **BAE Systems Ship Repair Facility.** The BAE Systems Ship Repair facility is located to the north of the project site. The short-term measurements at the ship repair docks reveal that the general noise character of the ship repair work is discontinuous and episodic, but also generally broadband and without substantial tonality. The lack of strong tonality results in the noise being perceived as less annoying than a similar noise level from a tonal source, such as a transformer or chiller. The fire pump at the western end of the dock runs continuously and has substantial tonality; however, the pump was not audible over the ambient conditions at any of the long-term measurement locations and in fact, is barely detectable in the short-term measurement made nearby at the western end of the ship repair docks.

  In the waterfront vicinity of the 28-Acre Site (near Location LT-1) where there are no other buildings to block the line-of-sight from Dry Dock 2, more high-frequency energy from activities, such as water blasting or painting, is present and audible. Another mildly tonal source is the Aggreko generators located between Dry Dock 2 and Dock 4 East. These generators contribute substantial noise at the northern, central, and eastern portions of the 28-Acre Site (Locations LT-1, LT-2 and LT-3). However, BAE has upgraded the electrical infrastructure at the shipyard, and these generators now only operate if a ship cannot connect to line power or during a power outage.

- **American Industrial Center (AIC).** The AIC is located west of the Illinois Parcels on the west side of Illinois Street. AIC is located on Third Street between 20th and 23rd Streets, and extends to Illinois Street. The facility comprises about 900,000 square feet of commercial, industrial and related supporting uses. AIC currently leases to approximately 300 tenants engaged in various commercial and industrial activities. The facility houses breweries, commercial kitchens and bakeries, garment manufacturing businesses, warehouses and distribution centers. On average, there are typically 2,500 to 3,000 people on the site at a given time.[10] AIC loading docks are located on Illinois Street, and

[10] Charles J. Higley, Farella Braun + Martel, LLP, *Pier 70 Mixed-Use District – EIR Scoping Comments,* June 5, 2015.

noise from loading activities could cause noise disturbance along the western Illinois Parcels boundary, across Illinois Street.

- **PG&E Potrero Substation**. There is a PG&E substation located south of the Illinois Parcels (south of the project site), and it contains large transformers and related electrical equipment that are not enclosed. Transformer noise can be disturbing, because transformers generate tonal noise (i.e., noise with simple or pure tones or "hum" components). Field observations indicate that transformer noise is audible, but heavy equipment and traffic noise on local streets dominate the ambient noise environment in this area. This type of noise source could be annoying during the nighttime hours, if audible at future residences.

- **Nearby Sporting or Special Events.** Project residents living along Illinois Street could possibly be subject to short-term, intermittent increases in traffic noise before and after events held at the existing AT&T Park and proposed Warrior's arena. Since these increases only occur for a short time before and after a game, they do substantially increase 24-hour (L_{dn} or CNEL) noise levels. Even so, these short-term, intermittent increases would likely be noticeable to these Project residents living adjacent to Illinois Street.

Groundborne Noise and Vibration

Groundborne noise is that which is experienced inside a building or structure from vibrations produced outside of the building and transmitted as ground vibration between the source and receiver. Groundborne noise can be a problem in situations where the primary airborne noise path is blocked, such as in the case of a subway tunnel passing near homes or other noise-sensitive structures. There are no known sources of existing groundborne noise or vibration in the vicinity of the project site. Distant Caltrain traffic (approximately ¼ mile west of the project site) and nearby light rail train operations (Third Street line, approximately 365 feet west of the Project's western boundary) both operate at the surface and generate airborne noise and surface vibration. Given their distance and surface location, these two sources are not considered to be substantial sources of groundborne noise or vibration for the 28-Acre Site or Illinois Parcels. There is no machinery or activities in the adjacent BAE Shipyard that would generate vibration on the 28-Acre Site or Illinois Parcels.[11]

Ambient Noise Measurements

To characterize the background noise environment in the project vicinity, a total of 14 noise measurements were collected. Four long-term (96 hours) and five short-term (15 to 30 minutes) measurements were collected north of and in the northern portion of the project site over a five-day

[11] Email communication dated February 2, 2016 from Dennis Deisinger, BAE Systems Ship Repair, to David Beaupre, Port of San Francisco, regarding vibration sources at the BAE Shipyard that could cause vibration in areas outside of BAE's leasehold area.

period[12] in May 2012 in order to determine noise characteristics of the BAE Shipyard repair activities and their effect on the project site's noise environment. In addition, one long-term and two short-term measurements were collected in the southeastern, southern, and western margins of the project site for a 48-hour period in April and August 2015.[13] Measurement locations are indicated on **Figure 5, Noise Measurement Locations.**

Noise measurement data is included in **Attachment 1, Vibro-Acoustic Consultants Report and Supplemental Noise Measurement Data.** A summary of noise measurement data is presented in **Table 6, Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring on the Project Site and Vicinity (dBA)**. Since it is one of the primary sources of noise on the Mixed-Use District project site, the frequency and tonal characteristics of the shipyard noise were measured as part of short-term measurements (see Attachment 1).

When noise measurements were taken in 2012, BAE was repairing a cruise ship. When this occurs, ship repair activities occur 24 hours per day, seven days a week. Since maximum BAE operations occurred during this measurement period, these measurements are considered the worst-case, maximum background ambient noise level since they include nighttime shipyard activities and operation of generators). Subsequent to the 2012 measurements, BAE completed an electrical upgrade, which allows docking ships to connect to line power instead of Aggreko electric power generators. These generators are located between Dry Dock 2 and Dock 4 East and can also be located on docking ships near the exhaust stack. While this upgrade reduced 2012 noise levels in the northern margin of the project site most of the time, these generators still operate on a short-term basis during power outages and if a ship cannot connect to line power.[14] Therefore, the 2012 measurements conservatively represent maximum noise levels generated at the BAE site

Sims Metals Management (SMM) was also operating in 2012 but has since closed. In 2012, it operated in the northeastern portion of the project site every day of the 2012 measurement period except Sunday. Since SMM no longer operates on-site, the noise levels measured on Sunday, May 13, 2012 (when SMM was not operating) are considered to reflect the existing ambient noise environment in the project vicinity.

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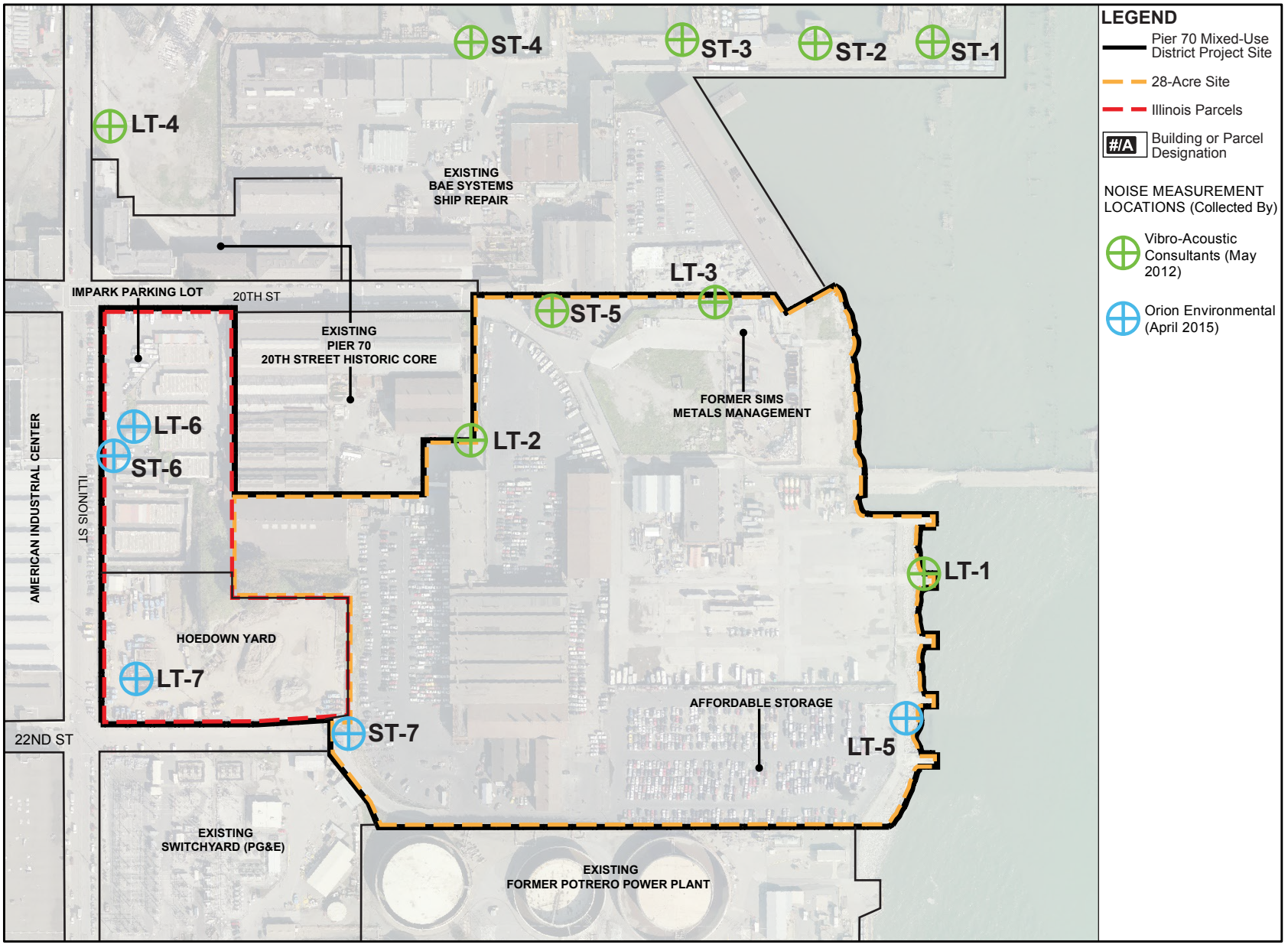
[12] Two long-term measurements (LT-1 and LT-2) were collected by Vibro-Acoustic Consultants (VACC) in the central and eastern portions of the 28-Acre Site, one long-term measurement (LT-3) was taken near the northeastern boundary of the 28-Acre Site, and one long-term measurement (LT-4) was collected by VACC along Illinois Street (north of the Mixed-Use District project site) from May 11 to May 16, 2012 (96 hours). Five short-term measurements (ST-1 through ST-5, 15 to 30 minutes) were also conducted by VACC during this same period in the vicinity of the BAE ship repair facilities, which are located north of the Mixed-Use District project site. The VACC report and noise measurement details are included in Attachment 1 (Noise Measurement Report and Data).

[13] Three long-term measurements (LT-5, LT-6, and LT-7) were collected at the waterfront on the 28-Acre Site and along Illinois Street on the Illinois Parcels by Orion Environmental Associates in the southern portion of the Mixed-Use District project site, while short-term measurements (ST-6 and ST-7, 15 minutes) were taken along the southern and western boundaries of the Mixed-Use District project site in April and August, 2015. Short-term measurements were taken with a Metrosonics Model dB 308 sound level meter, while the long-term measurement was taken with a 3M SoundPro SE/DL Type 2 sound meter.

[14] Email communication with David Beaupre, Port of San Francisco, on September 8, 2015 regarding the status of the electrical upgrade project and operation of Aggreko generators at the BAE Shipyard.



SOURCE: SITELAB URBAN STUDIO, ORION ENVIRONMENTAL

FIGURE 5: NOISE MEASUREMENT LOCATIONS

Table 6: Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring on the Project Site and Vicinity (dBA)

Measurement Location		Time Period	Ldn or Leq	Primary Noise Sources
LT-1:	Eastern boundary of 28-Acre Site on the waterfront, south of Pier 64, between Slips 5 and 6 (minimum of 1,100 feet south of BAE Shipyard)	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	69 dBA (Ldn) 66 dBA (Ldn)[a] 64 dBA (Ldn) 64 dBA (Ldn) **66 dBA (Ldn)**	BAE ship repair activities occurred days, nights, and weekends (24/7) during measurement period and were audible above background ambient noise levels during site visit. Large trucks and buses were observed during site visit and may have operated in parking lot near the meter.
LT-2:	Center of 28-Acre Site at north façade of Building 2	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	67 dBA (Ldn) 65 dBA (Ldn)[a] 65 dBA (Ldn) 67 dBA (Ldn **66 dBA (Ldn)**	Ambient noise dominated by traffic in the distance and local industrial activity; BAE Shipyard repair activities audible; and some lighting ballasts at the roof of Building 2 were very noisy, but did not affect noise measurement results.
LT-3:	Northeast boundary of 28-Acre Site southeast of Building 6 (minimum of 500 feet south of BAE Shipyard)	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	62 dBA (Ldn) 60 dBA (Ldn) 61 dBA (Ldn) 63 dBA (Ldn) **62 dBA (Ldn)**	Adjacent to Sims Metal Management (SMM), which was operating in 2012 but is no longer operating. Since SMM was closed on Sunday, 5/13/12, this level is more representative of the existing noise environment when cruise ship repair activities occur. Historic Building 6 helps block ship repair noise from this location and would continue to do so with the project.
LT-4:	East of Illinois Street, north of project site, in tow yard just north of Building 103.	Saturday, 5/12/12: Sunday, 5/13/12: Monday, 5/14/12: Tuesday, 5/15/12: **Average:**	61 dBA (Ldn) 61 dBA (Ldn) 63 dBA (Ldn) 63 dBA (Ldn) **62 dBA (Ldn)**	Construction of the residential development at 820 Illinois occurred directly across Illinois Street and these activities occurred everyday except Sunday. Ship repair activities were not audible at this location during site visit.
LT-5:	Southeastern boundary of 28-Acre Site on the waterfront, south of Pier 64 at Slip 8	Thursday, 4/2/15: Friday, 4/3/15: **Average:**	57 dBA (Ldn) 59 dBA (Ldn) **58 dBA (Ldn)**	Traffic and construction activities at Affordable Storage occurred near meter. Military ship (in for repair at BAE Shipyard) was moved from Drydock 2 to Berth 4-East around midnight.[b]
LT-6:	North-central portion of Illinois Parcels, east of Illinois Street, about 110 feet east of the centerline at Impark parking lot	Tuesday, 8/18/15 Thursday, 8/19/15 **Average:**	64 dBA (Ldn) 64 dBA (Ldn) **64 dBA (Ldn)**	Traffic on Illinois Street (including construction haul trucks), cars parking in ImPark lot, and traffic/activities at AIC to the west across Illinois.
LT-7:	Southwest portion of Illinois Parcels in Hoedown Yard, 110 feet from Illinois Street	Tuesday, 8/18/15 Daytime, 8/18/15 Wednesday, 8/19/15 Daytime, 8/19/15 **Average:**	67 dBA (Ldn) 63 dBA (Leq) 68 dBA (Ldn) 66 dBA (Leq) **68 dBA (Ldn)**	Heavy equipment at Hoedown Yard, Potrero Substation hum, traffic on Illinois and 22nd Streets, and AIC activities to the west across Illinois.

Table 6 (Cont'd): Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring on the Project Site and Vicinity (dBA)

	Measurement Location	Time Period	L_{dn} or Leq	Primary Noise Sources
ST-1:	North of project site at BAE Shipyard, at Dry Dock 2	Thursday, 5/17/12, 11:00 a.m. to noon, (15–30 minutes)	77 dBA (Leq)	Cruise ship repair activities, including nights and weekends.
ST-2:	North of project site at BAE Shipyard, West of Dry Dock 2	Thursday, 5/17/12 11:00 a.m. to noon, (15–30 minutes)	81 dBA (Leq)	Aggreko electric power generators operating 30 feet away.
ST-3:	North of project site at BAE Shipyard at Dock 4 East	Thursday, 5/17/12 11:00 a.m. to noon, (15–30 minutes)	76 dBA (Leq)	Military ship repair activities.
ST-4:	North of project site at BAE Shipyard at the western end of repair facilities	Thursday, 5/17/12 11:00 a.m. to noon, (15–30 minutes)	66 dBA (Leq); 77 dBA (Leq)	Ship repair activities at west end of ship repair docks; fire pump (runs continuously).
ST-5:	Northern boundary of 28-Acre Site adjacent to 20th Street at southern façade of BAE boiler building	Thursday, 5/17/12, 11:00 a.m. to noon (15–30 minutes)	76 dBA (Leq)[a]	BAE Site boiler facilities
ST-6:	West side of Illinois Parcels, about 50 feet east of the Illinois Street centerline	Wednesday, 4/1/15 at 11:30 a.m. to 11:45 a.m. (15 minutes)	64 dBA (Leq)	Traffic on Illinois Street, including construction haul trucks; heavy equipment operating to the south (in Hoedown Yard) was audible during measurement.
ST-7:	Southern boundary of project site, adjacent to 22nd Street at gate, 550 feet from Illinois Street	Wednesday, 4/1/15 noon to 12:15 p.m. (15 minutes)	58 dBA (Leq)	Heavy equipment at Hoedown Yard, Potrero Substation hum, and traffic on 22nd Street were audible.

Notes: Maximum BAE Shipyard operations (24/7) occurred during measurement of LT-1 through LT-4 and therefore, these measurements are considered the worst-case, maximum background ambient noise levels. No nighttime ship repair activities occurred during the LT-5 measurement period, but an undocking operation occurred around midnight on Friday, 4/3/15.

a During the 2012 measurement period, Sims Metals Management (SMM) operated in the northern portion of the project site every day except Sunday. Since SMM no longer operates on-site, the noise levels measured on Sunday, May 13, 2012 (when SMM was not operating) are considered to reflect the existing ambient noise environment in the project vicinity.

b Email Communication from Gerry Roybal, Maritime Marketing Manager, Port of San Francisco, on April 15, 2015.

Sources: VACC, 2012 (LT-1 through LT-4; ST-1 through ST-5); Orion Environmental Associates, 2015 (LT-5, LT-6, LT-7, ST-6, ST-7).

The 0 to 2 dBA difference in L_{dn} between Sunday and average noise levels at the three long-term measurement locations in the vicinity of SMM is not considered a substantial difference. When noise measurements were taken in 2015, there were intermittent noise sources observed during measurements. BAE Shipyard repair facilities typically operate during the daytime hours only, but an undocking operation occurred, which appeared to raise nighttime noise levels for a short time by 5 to 10 decibels, resulting in a minor increase in the 24-hour L_{dn} of 2 dBA.

A comparison of 2015 nighttime noise measurements collected along the western boundary of the Illinois Parcels (Location LT-6, which is 700 feet north of the Potrero Substation and 110 feet from the centerline of Illinois Street, and Location LT-7, which is 200 feet from the Potrero Substation and 110 feet from the

centerline of Illinois Street) indicate that as much as 10 to 13 dBA (L_{eq}) of the nighttime ambient noise levels could be attributable to noise generated by the Potrero Substation.

Both short-term and long-term noise measurements taken along Illinois Street in 2012 and 2015 were both affected by construction-related truck traffic traveling on Illinois Street, current activities at the PG&E Hoedown Yard (southwest corner of the Illinois Parcel), and construction of a multi-family development (820 Illinois Street) northwest of the site.

In the project vicinity, the primary sources of noise are BAE Systems Ship Repair facilities, various industrial activities (AIC Industrial Center, PG&E Hoedown Yard and Potrero Substation facilities), new development-related construction activities along Illinois Street, traffic on local streets in the project vicinity (Illinois Street, 20th Street, and 22nd Street), and the distant I-280 freeway. Noise measurements indicate that noise levels in the project site area averaged 66 dBA (L_{dn}, ranging between 60 and 70 dBA [L_{dn}]) when nighttime ship repair activities occur, and averaged 60 dBA (L_{dn}) or 6 dBA less when nighttime repair activities do not occur.[15]

Sensitive Receptors

Some land uses (and associated users) are considered more sensitive to ambient noise levels than others due to the types of activities typically involved with the land use and the amount of noise exposure (in terms of both exposure duration and insulation from noise). In general, occupants of residences, schools, daycare centers, hospitals, places of worship, and nursing homes are considered to be sensitive receptors (i.e., persons who are sensitive to noise based on their specific activities, age, health, etc.). There are industrial, commercial, and residential uses in the project site vicinity. Existing noise-sensitive receptors in the project vicinity (within 900 feet of the Project site) include residences and schools as listed below in **Table 7, Noise-Sensitive Receptors in the Project Vicinity** and their locations are indicated in **Figure 6, Noise-Sensitive Receptors in the Project Vicinity**. The UCSF Mission Bay Hospital (1825 4th Street) is located approximately 0.3 mile to the north. Also, there are additional planned residential developments in the project vicinity and they are also listed in Table 7**.** There are no skilled nursing facilities, churches, or public libraries in the immediate project vicinity.

REGULATORY AND PLANNING SETTING

Federal Regulations

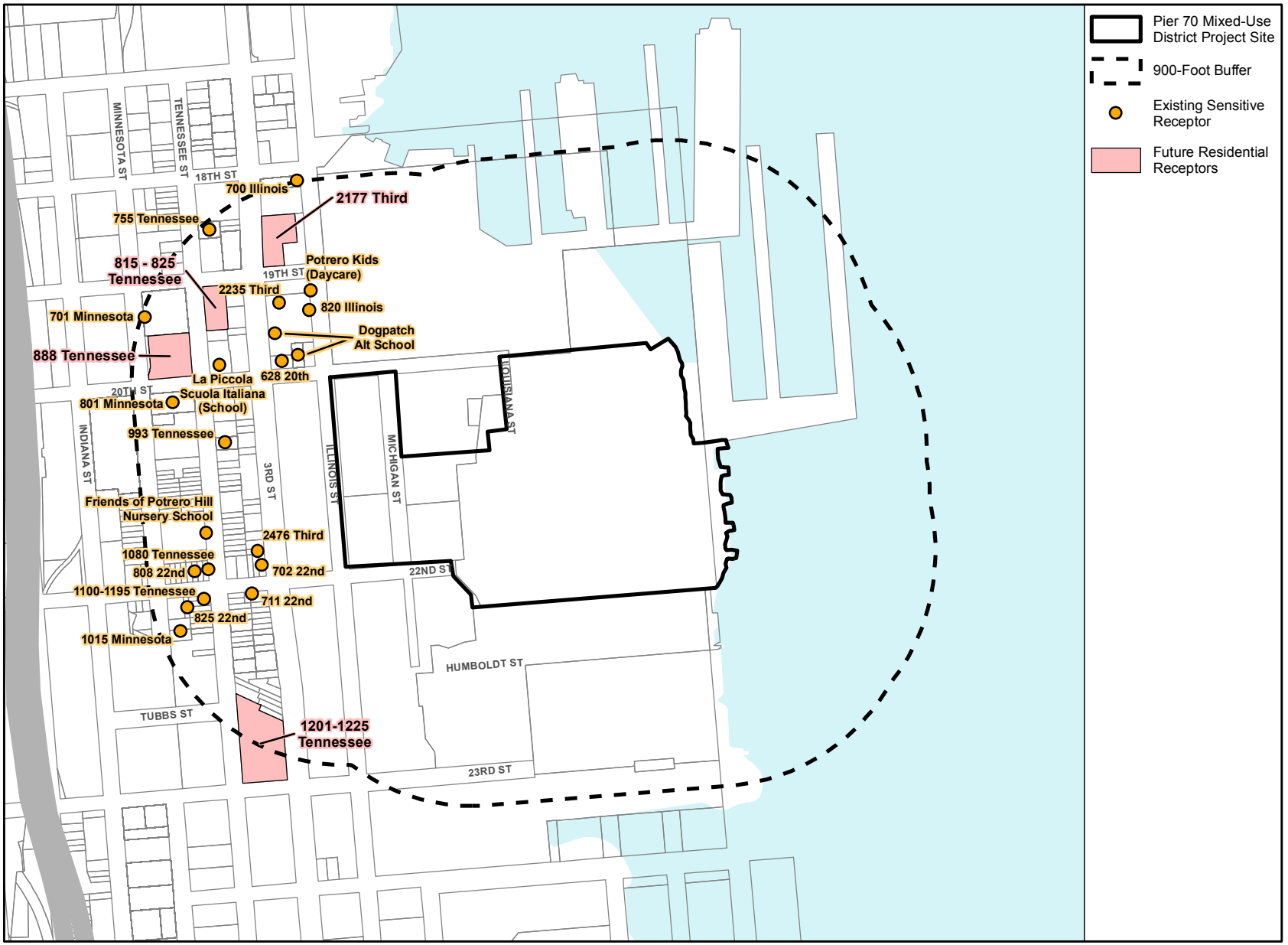
In 1972, the Noise Control Act (42 U.S.C. §4901 et seq.) was passed by Congress to promote noise environments in support of public health and welfare. It also established the U.S. Environmental Protection Agency (USEPA) Office of Noise Abatement and Control to coordinate federal noise control activities. The USEPA established guidelines for noise levels that would be considered safe for

[15] LT-1 is located approximately 1,100 feet from the BAE Shipyard repair facilities, while LT-5 is located approximately 1,400 feet from these repair facilities. When adjusted for this difference in distance (difference of 2 dB), nighttime noise levels at approximately 1,100 feet from the dry docks (LT-1) ranged from 57 to 61 dBA (L_{eq}) or 66 dBA (L_{dn}) with nighttime ship repair activities and 50 to 55 dBA (L_{eq}) or 60 dBA (L_{dn}) without nighttime ship repair activities.

Table 7: Noise-Sensitive Receptors in the Project Vicinity

Type of Sensitive Receptor	Address	Minimum Distance from Site
Existing Sensitive Receptors within 900 Feet of Project Site		
North of 20th Street (Northwest of Project Site)		
Dogpatch Alternative School (Site 2)	616 20th Street	140 feet
Residential	628 20th Street	190 feet
Potrero Kids (Daycare)	810 Illinois Street	350 feet
Residential	820 Illinois Street	200 feet
Residential	2235 Third Street	375 feet
Residential	993 Tennessee Street	460 feet (approx.)
La Piccola Scuola Italiana (School)	728 20th Street	470 feet (approx.)
Residential	700 Illinois Street	770 feet
Residential	755 Tennessee Street	800 feet
Residential	701 Minnesota Street	700 feet
Between 20th and 22nd Streets (West of Project Site)		
Dogpatch Alt School	2265 Third Street	250 feet
Residential	2476-2478 Third Street	370 feet
Residential	702-718 22nd Street	375-430 feet
Residential	1080 Tennessee Street	630 feet
Friends of Potrero Hill Nursery School	1060A Tennessee Street	630 feet
Residential	808-840 22nd Street	690-780 feet
Residential	801-976 Minnesota Street	650-915 feet
South of 22nd Street (Southwest of Project Site)		
Residential	711 22nd Street	380 feet
Residential	1100-1195 Tennessee Street	500 feet
Residential	825-829 22nd Street	700 feet
Residential	1015 Minnesota Street	750 feet
Future/Planned Residential Receptors within 900 Feet of Project Site		
North of 20th Street (North or Northwest of Project Site)		
Residential (Mixed)	815 Tennessee Street	525 feet
Residential (Mixed)	2177 Third Street	700 feet
Residential (Mixed)	888 Tennessee Street	650 feet
South of 22nd Street (Southwest of Project Site)		
Residential (Mixed)	1201-1225 Tennessee Street	780 feet

Source: Google Earth (Imagery Date 4/5/2016) for parcel data (land use, address, and distance to the site). *Baseline and Cumulative Projects List,* Chapter 4.a of the Pier 70 Mixed-Use District Project Draft EIR.



SOURCE: ORION ENVIRONMENTAL

FIGURE 6: NOISE-SENSITIVE RECEPTORS IN THE PROJECT VICINITY

community exposure without the risk of adverse health or welfare effects. The USEPA found that to prevent hearing loss over the lifetime of a receptor, the yearly average L_{eq} should not exceed 70 dBA, and the L_{dn} should not exceed 55 dBA in outdoor activity areas or 45 dBA indoors to prevent interference and annoyance. In 1982, the USEPA phased out the office's funding as part of a shift in federal noise control policy to transfer the primary responsibility of regulating noise to state and local governments.

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under Title 40 of the Code of Federal Regulations, Part 205, Subpart B. The federal truck passby noise standard is 80 dBA at 50 feet from the vehicle pathway centerline, under specified test procedures. These controls are implemented through regulatory controls on truck manufacturers. There are no comparable standards for vibration, which tend to be specific to the roadway surface, the vehicle load, and other factors.

State Regulations

Noise

With respect to noise insulation standards, the 2013 *California Building Code* (Title 24, Part 2 of the *California Code of Regulations* [CCR]) requires that walls and floor/ceiling assemblies separating dwelling units from each other or from public or service areas have a Sound Transmission Class (STC) of at least 50, meaning they can reduce noise by a minimum of 50 dB.[16] The Green Building Code standards (Section 1207.4, Allowable Interior Noise Levels) also specify a maximum interior noise limit of 45 dBA (L_{dn} or CNEL) in habitable rooms, and require that common interior walls and floor/ceiling assemblies meet a minimum STC rating of 50 for airborne noise.

The 2013 *Green Building Standards Code* (also part of the State building code; CCR Title 24, Part 11, and referenced below as the more commonly known "Title 24") specifies the following insulation standards for Environmental Comfort (Section 5.507) to minimize exterior noise transmission into interior spaces for non-residential buildings:

- Section 5.507.4.1, Exterior Noise Transmission, requires wall and roof-ceiling assemblies to have an STC of at least 50 and exterior windows to have a minimum STC of 30 for any of the following building locations: (1) within the 65-dBA, L_{dn}, noise contour of a freeway, expressway, railroad, or industrial source; and (2) within the 65-dBA noise contour of an airport. Exceptions include buildings with few or no occupants and where occupants are not likely to be affected by exterior noise, such as factories, stadiums, parking structures and storage or utility buildings. Section 5.507.4.1.1 requires non-residential buildings to be designed with exterior walls and roof-ceiling assemblies with an STC rating of 45 to provide an acceptable interior noise level of 50 dBA, L_{eq}, in occupied areas during any hour of operation.[17]

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[16] State *Building Code* Section 1207.2.

[17] California Building Standards Commission and International Code Council, *Guide to the 2013 California Green Building Standards Code (Nonresidential), Cal Green, Section 5.507, Environmental Comfort,* pp. 95-97, February 2014.

- 5.507.4.3, Interior Sound Transmission, requires wall and floor-ceiling assemblies separating tenant spaces and also separating tenant spaces and public places to have an STC of at least 40.
- 5.507.4.2, Interior Sound, requires wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places to have an STC of at least 40.

San Francisco has adopted the Green Building Code; it is enforced by DBI.

Vibration

To assess the damage potential to structures from ground vibration induced by construction equipment, various vibration criteria were reviewed and synthesized by Caltrans, and they are presented in **Table 8, Vibration Criteria for Potential Damage to Structures.** As indicated in this table, the threshold for continuous vibration sources is about half of the threshold for transient sources.

Table 8: Vibration Guidelines for Potential Damage to Structures

	Maximum Peak Particle Velocity (PPV) (in/sec)	
Structure Type and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Note:
Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans, *Transportation and Construction Vibration Guidance Manual,* September 2013, Table 19, p. 38. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed on December 16, 2016.

People are more sensitive to vibration during the nighttime hours when sleeping than during daytime waking hours. Numerous studies have been conducted to characterize the human response to vibration. As shown in **Table 9, Vibration Guidelines for Annoyance,** for steady-state (continuous) vibration, human response is typically "strongly perceptible" at 0.1 in/sec PPV, "distinctly perceptible" at 0.035 in/sec PPV, and "barely perceptible" at 0.01 in/sec PPV.

Table 9: Vibration Guidelines for Annoyance

Human Response	Maximum Peak Particle Velocity (in/sec, PPV)	
	Transient Sources[a]	Continuous/Frequent Intermittent Sources[b]
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.10

Notes:

in/sec = inches per second; PPV = peak particle velocity

[a] Transient sources create a single isolated vibration event, such as blasting or drop balls.

[b] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013, Table 20, p. 38. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed on December 16, 2016.

Local Regulations and Guidelines

San Francisco Police Code

In the City, regulation of noise is addressed in Article 29 of the Police Code (the Noise Ordinance), which states the City's policy is to prohibit unnecessary, excessive and offensive noises from all sources subject to police power. Section 2900 makes the following declaration with regard to community noise levels: "It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce noise levels, through all practicable means, in those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization's Guidelines on Community Noise."

Sections 2907 and 2908 of Article 29 regulate construction equipment and construction work at night, while Section 2909 provides for limits on stationary-source noise from machinery and equipment. Sections 2907 and 2908 are enforced by the Department of Building Inspection, and Section 2909 is enforced by the Department of Public Health. Summaries of these and other relevant sections are presented below.

Section 2907(a) of the Police Code limits noise from construction equipment to 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance. Exemptions to this requirement include impact tools with approved mufflers, pavement breakers, and jackhammers with approved acoustic shields, and construction equipment used in connection with emergency work. Section 2908 prohibits nighttime construction (between 8:00 p.m. and 7:00 a.m.) that generates noise exceeding the ambient noise level by 5 dBA at the nearest property line unless a special permit has been issued by the City.

Section 2909 generally prohibits fixed mechanical equipment noise and music in excess of 5 dBA more than ambient noise from residential sources, 8 dBA more than ambient noise from commercial sources, and 10 dBA more than ambient on public property at a distance of 25 feet or more. Section 2909(d) establishes maximum noise levels for fixed noise sources (e.g., mechanical equipment) of 55 dBA (7:00 a.m. to 10:00 p.m.) and 45 dBA (10:00 p.m. to 7:00 a.m.) inside any sleeping or living room in any dwelling unit located on residential property to prevent sleep disturbance, with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

The City's Guidelines for Noise Control Ordinance Monitoring and Enforcement, revised in December 2014, clarifies the definition of "ambient" as the L_{90} (the level of noise exceeded 90 percent of the time), and this noise descriptor is considered to be a conservative representation of the ambient under most conditions.[18] Ordinance compliance is determined by measuring the L_{90} for 10 minutes, with and without the noise source at issue. Use of the L_{90} descriptor is appropriate when determining code compliance of a fixed noise source (such as mechanical equipment), but is not appropriate for other aspects of an environmental impact analysis, which determines noise compatibility based on L_{dn} or CNEL, a different noise descriptor (as described above under Sound Fundamentals).

Use of Sound Amplifying Equipment

As discussed above under Project Features, the Proposed Project includes open space that would be programmed for various special events, some of which may include amplified sound and, therefore, may require a permit from the Entertainment Commission. Article 1, Section 47.2 of the Police Code regulates the use of any sound amplifying equipment, whether truck-mounted or otherwise, within the City and County of San Francisco and consists of the following regulations:

1. The only sounds permitted are music or human speech.

2. Hours of operation permitted shall be between 9:00 a.m. and 10:00 p.m.; operation after 10:00 p.m. is permitted only at the location of a public event or affair of general public interest or as otherwise permitted by the Entertainment Commission.

3. Except as permitted by the Entertainment Commission, sound shall not be issued within 450 feet of hospitals, schools, churches, courthouses, public libraries, or mortuaries.

4. No sound truck with its amplifying device in operation shall traverse any one block in the City and County more than four times in any one calendar day.

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[18] City and County of San Francisco, *San Francisco Police Code, Article 29: Regulation of Noise Guidelines for Noise Control Ordinance Monitoring and Enforcement, December 2014 Guidance (Supersedes All Previous Guidance),* December 2014. Available online at https://www.sfdph.org/dph/files/EHSdocs/ehsNoise/GuidelinesNoiseEnforcement.pdf. Accessed on April 22, 2015.

5. Amplified human speech and music shall not be unreasonably loud, raucous, jarring, or disturbing to persons of normal sensitiveness within the area of audibility, nor louder than permitted in Subsections (6) and (7) hereof.

6. When the sound truck is in motion, the volume of sound shall be controlled so that it will not be audible for a distance in excess of 450 feet from its source; provided, however, that when the sound truck is stopped by traffic, the said sound amplifying equipment shall not be operated for longer than one minute at such a stop.

7. Except as permitted by the Entertainment Commission for public gatherings, in all cases where sound amplifying equipment remains at one location or when the sound truck is not in motion, the volume of sound shall be controlled so that it will not be audible for a distance in excess of 250 feet from the periphery of the attendant audience.

8. No sound amplifying equipment shall be operated unless the axis of the center of any sound reproducing equipment used shall be parallel to the direction of travel of the sound truck; provided, however, that any sound reproducing equipment may be so placed upon said sound truck as to not vary more than 15 degrees on either side of the axis of the center of the direction of travel and, provided further, that radial, nondirectional type of loudspeakers may be used on said sound trucks either alone or in conjunction with sound reproducing equipment placed within 15 degrees of the center line of the direction of travel.

San Francisco Entertainment Commission Permits

Section 90.1 of the San Francisco Administrative Code establishes the role of the San Francisco Entertainment Commission to regulate, promote and enhance the field of entertainment in San Francisco. The seven-member commission has powers to accept, review, and gather information to conduct hearings for entertainment-related permit applications and rule upon and issue, deny, condition, suspend, revoke or transfer entertainment-related permits in accordance with applicable laws and regulations. Additionally, the Entertainment Commission plans and coordinates the provision of City services for major events for which there is no recognized organizer, promoter, or sponsor.

Pursuant to Section 1060.1 of the Police Code, the Entertainment Commission has permit authority over a variety of different permit types including Place of Entertainment permits, Outdoor Amplified Sound/Loudspeaker permits, and Limited Live Performance permits. Permit hearings require the applicant to provide proof of neighborhood outreach to the Commission. Such outreach must consist of at least two of four types of outreach: (1) presentation to a neighborhood, community or residential group; (2) presentation to the leadership of a local not-for-profit that deals with community support such as housing, at risk youth, health, or mental services; (3) a petition including an appropriate number of neighbor signatures according to the applicants business address; and/or (4) presentation to a business association if no community organization or not-for-profit exists near the venue.

San Francisco General Plan

The Environmental Protection Element of the San Francisco General Plan contains Land Use Compatibility Guidelines for Community Noise for determining the compatibility of various land uses with different noise levels (see **Figure 7, San Francisco Land Use Compatibility Chart for Community Noise**). These guidelines, which are similar to state guidelines set forth by the Governor's Office of Planning and Research, indicate maximum acceptable noise levels for various land uses. Although this figure presents a range of noise levels that are considered compatible or incompatible with various land uses, the maximum "satisfactory" noise level is 60 dBA (L_{dn}) for residential and hotel uses, 65 dBA (L_{dn}) for school classrooms, libraries, churches and hospitals, 70 dBA (L_{dn}) for playgrounds, parks, office uses, retail commercial uses and noise-sensitive manufacturing/ communications uses, and 77 dBA (L_{dn}) for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications and utilities. If these uses are proposed to be located in areas with noise levels that exceed these guidelines, a detailed analysis of noise reduction requirements is normally necessary for each building or group of buildings prior to final review and approval.

Objectives and policies in the Environmental Protection Element that pertain to the Proposed Project include the following:

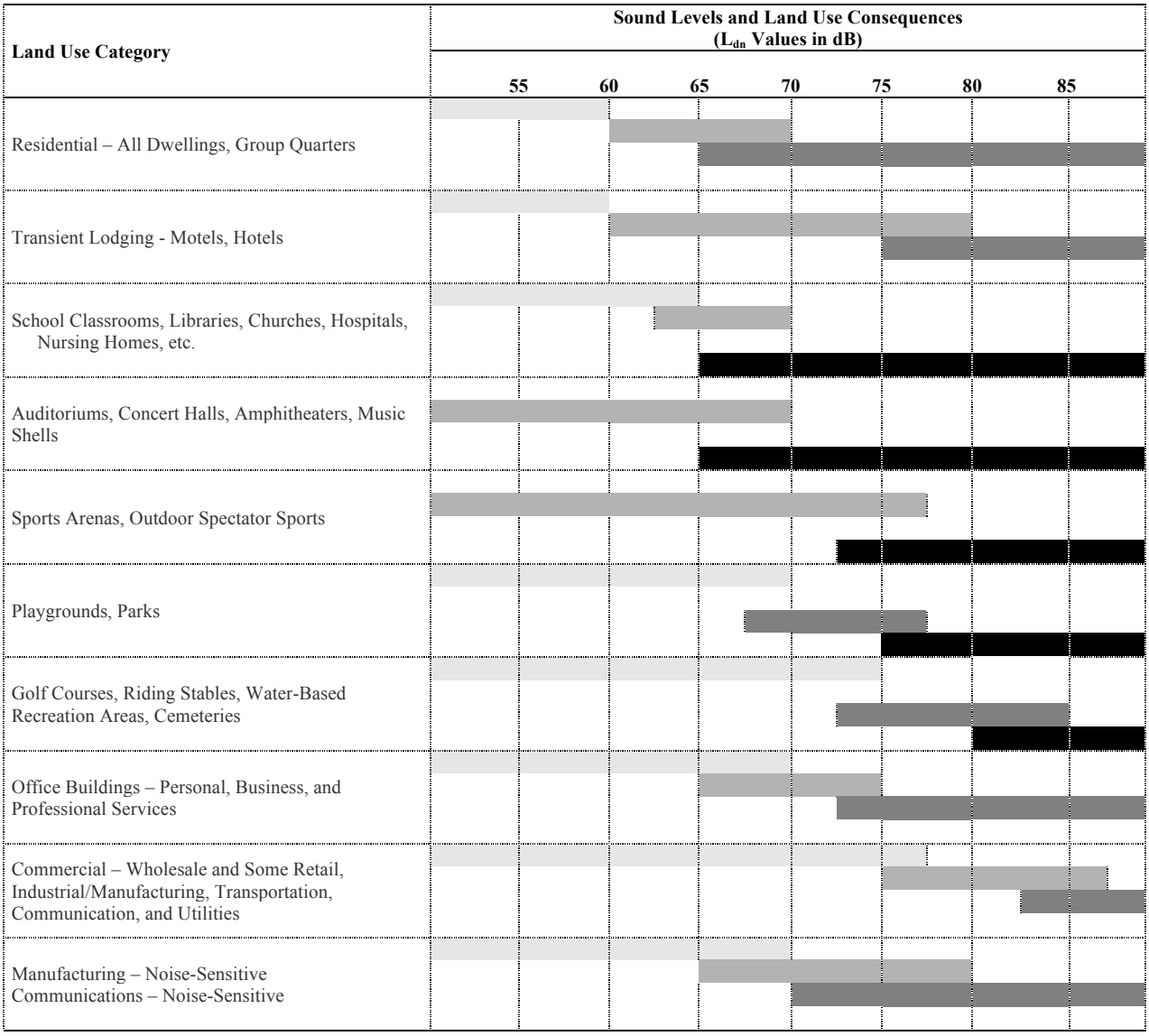
POLICY 9.2: Impose traffic restrictions to reduce transportation noise. Transportation noise levels vary according to the predominance of vehicle type, traffic volume, and traffic speed. Curtailing any of these variables ordinarily produces a drop in noise level. In addition to setting the speed limit, the City has the authority to restrict traffic on city streets, and it has done so on a number of streets. In addition, certain movement restraints can be applied to slow down traffic or divert it to other streets. These measures should be employed where appropriate to reduce noise.

POLICY 9.6: Discourage changes in streets which will result in greater traffic noise in noise-sensitive areas. Widening streets for additional traffic lanes or converting streets to one-way direction can induce higher traffic volume and faster speeds. Other techniques such as tow-away lanes and traffic light synchronization also facilitate heavier traffic flows. Such changes should not be undertaken on residential streets if they will produce an excessive rise in the noise level of those streets.

OBJECTIVE 10: MINIMIZE THE IMPACT OF NOISE ON AFFECTED AREAS. The process of blocking excessive noise from our ears could involve extensive capital investment if undertaken on a systematic, citywide scale. Selective efforts, however, especially for new construction, are both desirable and justified.

POLICY 10.1: Promote site planning, building orientation and design, and interior layout that will lessen noise intrusion. Because sound levels drop as distance from the source increases, building setbacks can play an important role in reducing noise for the building occupants. (Of course, if provision of the setback eliminates livable rear yard space, the value of the setback must be weighed against the loss of the rear yard.) Buildings sited with their narrower dimensions facing the noise source and sited to shield or be shielded by other buildings also help reduce noise intrusion. Although walls with no windows or small windows cut down on noise from exterior sources, in most cases it would not be feasible or desirable to eliminate wall openings. However,

Figure 7: San Francisco Land Use Compatibility Chart for Community Noise



Satisfactory, with no special noise insulation requirements. Noise levels in this range are considered "Acceptable."

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Noise levels in this range are considered "Conditionally Acceptable."

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Noise levels in this range are considered "Conditionally Unacceptable."

New construction or development should generally not be undertaken. Noise levels in this range are considered "Unacceptable."

Source: San Francisco Planning Department, 1996. *San Francisco General Plan*, adopted on June 27, 1996. Available online at: http://www.sf-planning.org/ftp/General_Plan/I6_Environmental_Protection.htm#ENV_TRA_11. Accessed March 12, 2015.

interior layout can achieve similar results by locating rooms whose use require more quiet, such as bedrooms, away from the street noise. In its role of reviewing project plans and informally offering professional advice on site development, the Department of City Planning can suggest ways to help protect the occupants from outside noise, consistent with the nature of the project and size and shape of the building site.

POLICY 10.2: Promote the incorporation of noise insulation materials in new construction. State-imposed noise insulation standards apply to all new residential structures except detached single-family dwellings. Protection against exterior noise and noise within a building is also important in many nonresidential structures. Builders should be encouraged to take into account prevailing noise levels and to include noise insulation materials as needed to provide adequate insulation.

POLICY 10.3: Construct physical barriers to reduce noise transmission from heavy traffic carriers. If designed properly, physical barriers such as walls and berms along transportation routes can in some instances effectively cut down on the noise that reaches the areas beyond. There are opportunities for a certain amount of barrier construction, especially along limited access thoroughfares and transit rights-of-way (such as BART), but it is unlikely that such barriers can be erected along existing arterial streets in the city. Barriers are least effective for those hillside areas above the noise source. Where feasible, appropriate noise barriers should be constructed.

OBJECTIVE 11: PROMOTE LAND USES THAT ARE COMPATIBLE WITH VARIOUS TRANSPORTATION NOISE LEVELS. Because transportation noise is going to remain a problem for many years to come, attention must be given to the activities close to the noise. In general, the most noise-sensitive activities or land uses should ideally be the farthest removed from the noisy transportation facilities. Conversely, those activities that are not seriously affected by high outside noise levels can be located near these facilities.

Central Waterfront Plan

OBJECTIVE 1.5: MINIMIZE THE IMPACT OF NOISE ON AFFECTED AREAS AND ENSURE GENERAL PLAN NOISE REQUIREMENTS ARE MET. Noise, or unwanted sound, is an inherent component of urban living. While environmental noise can pose a threat to mental and physical health, potential health impacts can be avoided or reduced through sound land use planning. The careful analysis and siting of new land uses can help to ensure land use compatibility, particularly in zones which allow a diverse range of land uses. Traffic is the most important source of environmental noise in San Francisco. Commercial land uses also generate noise from mechanical ventilation and cooling systems, and though freight movement. Sound control technologies are available to both insulate sensitive uses and contain unwanted sound. The use of good urban design can help to ensure that noise does not impede access and enjoyment of public space.

Policies that address Objective 1.5 above are as follows:

POLICY 1.5.1: Reduce potential land use conflicts by providing accurate background noise-level data for planning.

POLICY 1.5.2: Reduce potential land use conflicts by carefully considering the location and design of both noise generating uses and sensitive uses in the Central Waterfront.

METHODOLOGY

Noise

Methodology for Analysis of Construction Impacts

Project implementation would result in operation of heavy equipment on the project site for demolition of existing structures, construction of new structures, and rehabilitation of on-site structures to be retained. Construction activities would occur intermittently on the project site over the 11-year construction duration and could expose nearby sensitive receptors to temporary increases in noise levels substantially in excess of ambient levels. Project construction would also result in temporary increases in truck traffic noise along haul routes for off-hauling excavated materials and materials deliveries. To assess potential short-term construction noise impacts, sensitive receptors and their relative exposure were identified and described. When determining exposure to noise, consideration was given to factors such as structural barriers and distance because of their ability to attenuate noise.

Operation of on-site equipment expected to be used in project construction were estimated based on equipment noise data published by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), as shown in Table 8: Typical Construction Noise Levels. The sources assessed were identified by the project sponsor as likely equipment to be used during project construction. The roadway noise construction model of the FHWA was then used to predict noise levels at the nearest receptors during both pile-driving activity and non-impact construction activity.

Construction-related noise impacts were assessed in part using the U.S. Federal Transit Administration (FTA) methodology for general quantitative noise assessment.[19] This methodology calls for estimating a combined noise level from simultaneous operation of the two noisiest pieces of equipment expected to be used in each construction phase. This method applies usage factors to each piece of equipment analyzed to account for the time that the equipment is in use over the specified time period. Given the size of the project site, the minimum distance between source and receptor was based on the distance between the closest boundary to the specified receptors.

Proposed construction activities would be required to comply with the San Francisco Noise Ordinance. The San Francisco Noise Ordinance prohibits construction activities between 8:00 p.m. and 7:00 a.m., and limits noise from any individual piece of construction equipment, except impact tools approved by the San Francisco Public Works, to 80 dBA at 100 feet, which is equivalent to 86 dBA at 50 feet. Noise increases from operation of construction equipment are also compared to this ordinance noise limit as

[19] U.S. Department of Transportation, Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment, Section 12.1.1 Quantitative Noise Assessment Methods,* May 2006, pp. 12-4 to 12-8. Available online at http://www.fta.dot.gov/12347_2233.html. Accessed on March 13, 2016.

well as FTA guidelines (at residential uses, 90 dBA (L_{eq}) during the day and 80 dBA during the night because they are noise-sensitive) to determine if noise increases could adversely affect existing off-site noise-sensitive receptors or future on-site receptors. Additionally, the Planning Department considers an increase of 10 dBA over existing noise levels ("Ambient+10 dBA" threshold) due to persistent construction, which generally represents a perceived doubling of loudness, to be a substantial temporary increase in noise levels.

Methodology for Analysis of Operational Impacts

Operation of the Proposed Project would result in permanent increases in ambient noise levels, primarily through project-related increases in traffic, addition of stationary equipment, and introduction of new uses, events, and activities on the project site. Operational noise issues evaluated in this analysis include: (1) noise increases resulting from the Proposed Project's stationary and mobile noise sources; (2) compatibility of the Proposed Project's noise-sensitive sensitive uses and existing uses in the project site vicinity with future noise levels at the project site, as defined by San Francisco Land Use Compatibility Guidelines for Community Noise; and (3) any operations or activities with the potential to cause sleep disturbance. Traffic noise modeling was performed using the FHWA Traffic Noise (RD-77-108) Model. Noise increases from operation of stationary equipment on the project site are compared to ordinance noise increase limits to determine if noise increases could adversely affect existing off-site noise-sensitive receptors or future on-site receptors.

Traffic increases associated with the Proposed Project would result in traffic noise increases along local streets. In general, traffic noise increases of less than 3 dBA are barely perceptible to people, while a 5-dBA increase is readily noticeable.[20] Therefore, permanent increases in ambient noise levels of more than 5 dBA are considered to be unacceptable. However, in places where the existing or resulting noise environment is not "Conditionally Acceptable," "Conditionally Unacceptable," or "Unacceptable" based the San Francisco Land Use Compatibility Chart for Community Noise (Figure 7), any noise increase greater than 3 dBA is considered to be unacceptable.

Traffic noise levels on 79 road segments in the project vicinity were modeled using traffic volumes presented in the *Pier 70 Traffic Impact Study*.[21] These modeled traffic noise levels were used to determine the change in traffic noise levels resulting from changes in traffic volumes. The above thresholds (more than a 5-dBA increase, or 3-dBA increase where ambient noise levels are Conditionally Acceptable, Conditionally Unacceptable or Unacceptable) were applied to determine whether these incremental noise increases would be acceptable or unacceptable.

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[20] California Department of Transportation, Division of Environmental Analysis, "Technical Noise Supplement," November 2009; pp. 2-48 – 2-49. Available online at http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf.

[21] Fehr & Peers, Pier 70 Mixed-Use District Project Transportation Impact Study, 2016. A copy of this report is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2014.001272ENV.

Vibration

Vibration is considered substantial if it is at levels high enough to cause damage to nearby structures or buildings or cause annoyance at sensitive receptors. Groundborne noise occurs when vibrations transmitted through the ground result in secondary radiation of noise. Construction-related groundborne noise is generally associated with underground construction activities where the airborne noise path is blocked, which is not proposed as part of this project. Therefore this analysis is focused on groundborne vibration from construction-related activities such as the use of certain types of pile-driving and heavy equipment.

This evaluation compares estimated vibration levels to vibration levels identified by Caltrans as potentially causing architectural damage to buildings. For adverse human reaction, this analysis compares estimated vibration levels to those which are typically "strongly perceptible" (0.1 inches per second [in/sec] PPV).[22]

RESULTS AND DISCUSSION

Construction-Related Noise and Vibration

On-Site Equipment Operation

Construction activity noise levels at and near any construction site would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment. Construction-related material haul trips would increase ambient noise levels along haul routes, with the magnitude of the increase depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises (such as pile driving), which can be particularly annoying to most people. Given the project's proximity to the Bay, it is assumed that at least some development in the project site area, such as the secant walls proposed in the northeastern and southeastern portions (near Parcels B and H2) would entail pile-driving activities.

Table 10, Typical Construction Noise Levels, shows typical noise levels associated with a range of construction equipment associated with new construction. As indicated in this table, operation of jackhammers and concrete saws have the potential to exceed the 86-dBA at 50 feet or 80-dBA at 100 feet noise limit for construction equipment (as specified in the *Police Code)* by 2 to 4 dBA. While jackhammers with approved acoustic shields are exempt from this ordinance limit (Section 2907(b)), concrete saws would not be exempt. All construction equipment will be required to employ necessary noise control measures (Construction Noise Approach 1, below) in order to comply with the noise limit specified in the *Police Code*, which would minimize the potential for noise disturbance of future on-site residents.

[22] Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed December 16, 2016.

Table 10: Typical Construction Noise Levels

Construction Equipment	Noise Level (dBA, Leq at 50 feet)	Noise Level (dBA, Leq at 100 feet)
Jackhammer (Pavement Breaker)[1]	**88**	**82**
Concrete Saw or Mounted Impact Hammer (Hoe Ram)	**90**	**84**
Loader	79	73
Dozer	82	76
Excavator	81	75
Grader	85	79
Compactor	83	77
Dump Truck	76	70
Flatbed Truck	74	68
Concrete Truck	81	75
Forklift (gas-powered)	83	77
Street Sweeper (vacuum)	82	76
Generator	81	75
Compressor	78	72
Roller	80	74
Crane	81	75
Paver	77	71
Pile Driver[1]	**101**	**95**
San Francisco Noise Ordinance Limit	86	80

Notes: Noise levels in bold exceed the above ordinance limit, but as indicated, two of the three exceedances are exempt from this limit.

[1] Exempt from the ordinance requirement of 80 dBA at 100 feet.

Sources: U.S. Department of Transportation, Federal Highway Administration, *9.0 Construction Equipment Noise Levels and Ranges, Table 9.1, RCNM Default Noise Emission Reference Levels and Usage Factors, Construction Noise Handbook,* Updated July 2011. Available online at http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm, Accessed January 4, 2016; U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* May 2006. Available online at http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf, Accessed January 4, 2016.

Implementation of noise control measures recommended in Construction Noise Approach 1 would ensure that all construction equipment noise subject to the noise ordinance be maintained at or below the 86-dBA limit, reducing potential construction-related noise impacts on future on-site residents.

On-Site Construction Activities

Project implementation would result in operation of heavy equipment on the project site for demolition of existing structures, construction of new structures, and rehabilitation of on-site structures to be retained. Construction activities would occur intermittently on the project site over the 11-year construction duration and could expose nearby sensitive receptors to temporary increases in noise levels substantially in excess of ambient levels.

Proposed redevelopment of the Pier 70 Mixed-Use District project site would result in demolition of seven existing structures, removal of a portion of Irish Hill, demolition of portions of the existing Slipways 5-8, construction of new buildings and rehabilitation of three existing buildings. Figure 3, Phased Demolition Plan - Maximum Residential Scenario, and Figure 4, Phased Demolition Plan - Maximum Commercial Scenario, show the proposed buildings to be demolished under each scenario. Construction activities associated with new building construction would include site preparation, pile driving, placement of

infrastructure, placement of foundations for structures, and fabrication of structures. Demolition and construction activities would require the use of heavy trucks, material loaders, cranes, concrete saws, and other mobile and stationary construction equipment listed in Table 10 (Typical Construction Noise Levels) above. Piles would be driven with the use of impact or vibratory pile drivers. General building construction would be less noise intrusive, involving cranes, forklifts, saws, and nail guns. Project construction would also result in temporary increases in truck traffic noise along haul routes for off-hauling excavated materials and materials deliveries.

Because the Proposed Project would be constructed in phases over an 11-year period, multiple construction activities could be occurring on different parcels within the project site at any given time (i.e., demolition could occur on one parcel while pile driving occurs on another) so that some of the noisier construction activities, such as pile driving, on one project parcel could overlap with other noisier construction phases, such as demolition, on other parcels. If pile drivers operated on one parcel while a mounted impact hammer or concrete saw (for demolition) occurred on another parcel at the same time (worst-case condition), the combined noise level from these two noisiest pieces of equipment would be 89 dBA (Leq) at 50 feet.[23] When compared to the FTA daytime thresholds of 90 dBA (L_{eq}) at residential uses and 100 dBA (L_{eq}) at commercial/ industrial uses, the maximum combined L_{eq} noise level would not exceed these thresholds. It is noted that while pile driving and demolition activities could occur at any given time over the 11-year construction duration, they would not occur continuously over this time period and it is unlikely that pile drivers and either impact hammers or concrete saws would not operate simultaneously at closer than 50 feet from any existing residential or commercial uses for any sustained period of time.

Noise Impacts on Off-Site Receptors

As listed in Table 7 (Noise-Sensitive Receptors in the Project Vicinity), the closest existing off-site sensitive receptors are located 140 to 200 feet from the closest site boundary (northwest corner of Parcel PKN). When construction occurs near the northwest corner of Parcel PKN, the maximum combined L_{eq} noise level of 89 dBA (L_{eq}) at 50 feet would attenuate to 80 dBA and 77 dBA (L_{eq}) at these respective receptors. Measurement Location LT-4 (across the street from the 820 Illinois Street residential development) is the closest noise measurement location to these receptors. Ambient noise levels averaged 62 dBA (L_{dn}) or an average of 57 dBA (daytime L_{eq}) at this location and when these ambient noise levels are applied to the Planning Department's Ambient+10 dBA guideline, the applicable guideline would be 72 dBA (L_{dn}) or 67 dBA (daytime L_{eq}) at these receptors and the maximum combined noise levels at the three closest off-site receptors would exceed these thresholds by up to 13 dBA, indicating the potential that these three receptors could be adversely affected by construction noise.

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[23] A 20 percent usage factor was applied to both pieces of equipment. Pile drivers generate 101 dBA (L_{max}) or 88 dBA (L_{eq}) with a 20 percent usage factor. Mounted impact hammers generate 90 dBA (L_{max}) or 83 dBA (L_{eq}) with a 20 percent usage factor. If these two pieces of equipment were to operate at the same time in the same vicinity (not likely since one would be used for demolition and the other as part of foundation work), the combined noise level would be 89 dBA (L_{eq}).

For all but these three receptors (residences at 820 Illinois Street and 628 20th Street [second floor], and Alt School at 616 20th Street), there are intervening buildings that would block and reduce Proposed Project-related construction noise at nearby existing and planned receptors.[24] For example, the AIC building to the west of the site would interrupt the line-of-sight (at ground level and lower floors) between the project site and existing residential receptors located west of the AIC building. If phasing occurs as proposed, it would result in the construction of residential buildings on the western portion of the project site (Illinois Parcels) first. These buildings would also help block and reduce Project-related construction noise (including noise from pile driving activities to the east on the 28-Acre Site) at all existing off-site receptors (including the closest existing receptors).

With implementation of noise controls during all construction phases (Construction Noise Approach 1, below) as well as implementation of noise controls during pile driving (Construction Noise Approach 2, below), the potential for noise disturbance of existing off-site residents (assumed to be occupied during the 11-year construction period) located approximately 140 feet to 200 feet to the northwest would be reduced. However, these measures would not necessarily reduce these noise increases to below the Planning Department's Ambient+10 dBA guideline because feasibility of quieter, alternative methods in all areas cannot be determined at this time.

Noise Impacts on On-Site Receptors

While early construction of Proposed Project residential uses on the Illinois Parcels would help reduce construction-related noise levels at existing receptors, it would also expose future residents living in these new residential buildings to construction noise generated during subsequent phases of Project construction. Construction activities in this area would occur in phases over an 11-year period. Phasing may not occur exactly as laid out in the conceptual phasing plan, but this plan provides a representative approximation of Project phasing.

If Proposed Project phasing occurs as proposed for the Maximum Residential Scenario, residential uses would be developed during all five phases (2018 to 2029), while commercial and RALI uses would be developed during all phases except Phase 1. If Proposed Project phasing occurs as proposed for the Maximum Commercial Scenario, more residential areas would be developed in the early phases (Phases 1, 2, and 3; 2018 to 2023) while more commercial uses would be developed in the later phases (Phases 3, 4, and 5; (2021-2029). As a result of this possible phasing under either scenario, future residents in the project site area that face an adjacent or nearby construction project could be subject to demolition and construction noise for as long as 6 to 9 years. Construction-related noise generated on any given parcel would primarily affect receptors located within about 900 feet and with a direct line-of-sight (a piece of equipment generating 85 dBA would attenuate to 60 dBA over a distance of 900 feet). Depending on the

[24] The three exceptions are the east-facing existing residential units on the upper floors of the residential building at 2235 Third Street (located approximately 200 feet northwest of the project site boundary), the east-facing residential units at 616-620 20th Street (located about 120 feet from the project site boundary), and the top floor (one residential unit) of Building 101 in the 20th Street Historic Core (located about 75 feet from the project site boundary).

order of construction within each phase and overall phasing, some Proposed Project buildings that have already been constructed could interrupt the direct line-of-sight between construction sources and noise-sensitive receptors, and reduce the number of receptors directly exposed to construction noise with no intervening buffering structure.

It is likely that pile driving will be required for construction of some buildings or structures on the 28-Acre Site and possibly on the northern portion of the Illinois Parcels. Construction of secant walls in the northeastern and southeastern portions of the 28-Acre Site could also require pile driving on upland portions of the site. In addition, other impact tools such as jackhammers, concrete saws, or mounted impact hammers (hoe rams) could be used during demolition activities. As indicated above, simultaneous operation of such equipment would generate a maximum combined L_{eq} noise level of 89 dBA (L_{eq}) at 50 feet. Future on-site residents with a direct line-of-sight and 50 feet from demolition or construction activities could be subject to such maximum combined noise levels. As listed in Table 6 (Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring on the Project Site and Vicinity), ambient noise levels on the project site ranged between 58 dBA and 68 dBA (L_{dn}) and averaged 64 dBA (L_{dn}). Daytime noise levels ranged from 53 dBA (L_{eq}) to 73 dBA (L_{eq}) and average 61 dBA (L_{eq}). When these ambient noise levels are applied to the Planning Department's Ambient+10 dBA guideline, the average thresholds are 74 dBA (L_{dn}) and 71 dBA (daytime L_{eq}) at on-site receptors, and the maximum combined noise level of 89 dBA (L_{eq}) at 50 feet would, at times, exceed this guideline at the closest future on-site residential receptors (those occupying residential units built in earlier phases) by up to 18 dBA. The degree of disturbance would vary with proximity of the demolition and construction activities to sensitive receptors.

Construction of proposed changes to the street network, new infrastructure (including those associated with all three sewer options), and open space improvements in the project site area would include use of similar construction equipment as would development projects, although typically for a lesser duration and generally with fewer pieces of equipment than for a major development. Accordingly, construction noise impacts associated with the street network, new infrastructure, and open space would be similar to, but somewhat less substantial than, those for development projects in the project site area, except that pile driving would not be necessary for the street network changes, utility lines (including those associated with all three sewer options), or open space improvements. Building demolition, road construction and building construction would all occur concurrently within each phase. It is expected that infrastructure improvements (including utility lines proposed in roadways) would be done at the same time as road construction. Construction of open space would occur during all five phases of construction. Simultaneous operation of the noisiest pieces of equipment associated with demolition (mounted impact hammer or concrete saw) and other construction activities (excavator) would result in a combined noise level of 85 dBA (L_{eq}) at 50 feet. Such maximum combined noise levels would still exceed the average "Ambient+10 dBA" guideline of 74 dBA (L_{dn}) or 71 dBA (daytime L_{eq}) at on-site receptors located at this proximity. Therefore, construction-related noise increases generated during other phases of construction, such as construction for road and infrastructure improvements, could adversely affect future on-site residents.

Feasible noise avoidance and minimization approaches and practices for construction (Construction Noise Approach 1, below) and pile driving activities (Construction Noise Approach 2, below) could be

employed to minimize the noise disturbance of the existing school approximately 140 feet to the northwest, existing residential units approximately 190 to 200 feet to the northwest, and future on-site residents. However, even with implementation of these noise minimization approaches, the potential would still exist that combined noise levels from simultaneous operation of the noisiest types of construction equipment could still exceed the Ambient+10 dBA guideline.

Off-site Haul Truck Traffic

The net export total of about 340,000 cubic yards of soil and an import of about 20,000 cubic yards of clean fill would generate a total of about 45,000 truck trips, which would be phased over the duration of the planned construction activities (averaging 17 truck trips per day). This average daily increase would be minor on the principal major access streets in the project vicinity, comprising less than 0.1 percent of daily traffic on Illinois Street in the project vicinity and an even smaller percentage of daily traffic on Third Street. Construction-related truck trips generated during the estimated 11-year Project construction duration would be required by the Construction Traffic Control Plan to travel on designated truck routes (i.e., Third Street and Cesar Chavez Street for regional access to the I-280 and SR 101 freeways[25]), minimizing truck traffic in residential areas. There are residential uses on Third Street between 22nd Street and 23rd Street, but no residential uses on this street to the south (between 23rd Street and Cesar Chavez Street). There are no existing residential uses on Cesar Chavez Street between Third Street and the SR 101 freeway. There are also no residential uses on Illinois Street between 22nd Street and Cesar Chavez Street, although this street is not a designated truck route. Given the minimal increase in traffic on local roadways that would be attributable to Project-related haul trucks, temporary increases in traffic noise resulting from haul trucks would not have a substantial effect. Use of truck routes that avoid residential uses as required by the Construction Traffic Control Plan would further reduce potential construction-related noise impacts.

Groundborne Noise and Vibration

Groundborne noise refers to a condition where noise is experienced inside a building or structure as a result of vibrations produced outside of the building and transmitted as ground vibration between the source and receiver. Groundborne noise can be problematic even in situations where the primary airborne noise path is blocked, such as in the case of a subway tunnel passing in close proximity to homes or other noise-sensitive structures. While the Proposed Project would involve excavation to a maximum depth of 27 feet, noise and vibration-generating construction activities associated with construction of proposed basements level would not involve tunneling or underground construction where the airborne noise path is blocked, but instead would use techniques that generate airborne noise and surface vibration. Therefore, impacts related to groundborne noise from construction activities are not expected to be substantial.

[25] San Francisco Municipal Transportation Agency, 2009. *San Francisco Truck Traffic Routes.* Trucks are expected to use truck routes, arterials or freeways except for local deliveries.

The Proposed Project would include the types of construction activities that could produce excessive groundborne vibration (i.e., pile driving for foundations or secant walls). In addition, construction equipment used for demolition, site preparation, and shoring activities, such as jackhammers, pavement breakers, and drills, could generate varying degrees of temporary groundborne vibration, with the highest levels expected during demolition, excavation, and below-grade construction stages of each construction phase. Excavation for basements on the Illinois Parcels would require excavation into bedrock where use of hoe-rams or jackhammers would be required. Project construction would also entail the use of heavy trucks for material deliveries and for off-site hauling of excavated materials and demolition debris during the daytime hours and throughout the 11-year construction period. All construction activities would be conducted primarily between 7:00 a.m. and 8:00 p.m. in compliance with Section 2908 of the City's Noise Ordinance and subject to noise controls outlined in Construction Noise Approaches 1 and 2 below.

If groundborne vibration generated by Project-related demolition and construction activities were to exceed 0.5 in/sec Peak Particle Velocity (PPV), it could cause cosmetic damage to a nearby structure. Older structures (i.e., potentially historic), such as the unreinforced monumental masonry Buildings 113 and 114 may be more fragile and cosmetic damage could occur at lower vibration levels, possibly as low as 0.2 in/sec PPV. Typical vibration levels associated with the operation of various types of construction equipment at 25, 60, and 160 feet, some of which are similar to those proposed to be used for this Project, are listed in **Table 11, Vibration Levels for Construction Equipment**. While vibration attenuation with distance can vary depending on subsoils, normal attenuation rates indicate that vibration generated by impact pile drivers could result in cosmetic damage to adjacent historic buildings if it occurs within 160 feet of these buildings. Parcel PKN is located approximately 80 feet from the older Buildings 113 and 114, and Parcel A is located approximately 50 feet from Building 113. Cosmetic damage to existing and future buildings on the project site could occur if impact pile drivers are operated within 70 feet of Project structures and 160 feet of Buildings 113 or 114, assuming maximum reference vibration levels. Use of sonic or vibratory pile drivers, if feasible, would typically generate lower levels with commensurate minimum setback distances of approximately 35 feet from Project structures and 70 feet from historic buildings required to avoid cosmetic damage.

Pile driving and building locations on Project parcels have not been specified for the entire site, but pile driving is proposed adjacent to and east of the 20th Street Historic Core, which adjoins the northwestern boundary of the 28-Acre Site and eastern boundary of the 20th/Illinois Parcels. While it may be possible to maintain a setback of 70 feet or more between pile drivers and adjacent structures at many locations to avoid cosmetic damage to adjacent structures, the minimum separation between some parcels such as between Parcel E1, Parcel E4 and Building 21 or between Parcels E2 and E3 would also be less than 70 feet. At distances of less than 70 feet, vibration from impact or vibratory pile driving activities could result in cosmetic damage to Project structures and historic Buildings 113 and 114. When the more stringent threshold of 0.2 in/sec PPV is applied to historic buildings, cosmetic damage could occur at distances of up to 160 feet from historic buildings (as indicated in Table 8, Vibration Guidelines for Potential Damage to Structures). However, implementation of vibration minimization approaches and practices for pile driving and other construction activities (Construction Noise Approach 3, below) could be employed to minimize the potential for cosmetic damage to adjacent Project and historic structures.

Table 11: Vibration Levels for Construction Equipment

Equipment	Peak Particle Velocity (PPV) (in/sec)		
	At 25 Feet	At 60 Feet[1]	At 160 Feet[1]
Impact or Vibratory Pile Driver			
Range	0.170–1.518	0.065–0.579	0.022-0.197
Typical	0.65	0.248	0.084
Other Construction Equipment			
Vibratory Roller/Compactor	0.210	0.080	0.027
Large Bulldozer	0.089	0.034	0.012
Caisson Drilling	0.089	0.034	0.012
Loaded Trucks	0.076	0.029	0.010
Jackhammer	0.035	0.013	0.005
Small Bulldozer	0.003	0.001	0.000

Note:

[1] Vibration amplitudes for construction equipment assume normal propagation conditions and calculated using the following formula: PPV equip = PPVref x $(25/D)^{1.1}$ where:

- PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
- PPV (ref) = the reference vibration level in in/sec from pages 31-33 and Table 18 of the Caltrans Vibration Guidance Manual as well as Table 12-2 of the FTA Noise and Vibration Guidance Manual
- D = the distance from the equipment to the receiver

Source: Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013, pp. 29-34. Available online at http://www.dot.ca.gov/hq/env/noise/publications.htm. Accessed on December 16, 2016; Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* May 2006. Available online at https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/noise-and-vibration. Accessed on December 16, 2016.

Depending on the timing of development at Parcels E2, E3 and E4, as well as the timing of the proposed relocation of historic Building 21 to within 25 feet of new development, construction-related vibration impacts on this building from adjacent pile driving activities could be avoided entirely if development precedes relocation. If, however, relocation of Building 21 precedes development at adjacent Parcels E2, E3, and E4, impact or vibratory pile driving activities could result in cosmetic damage to this historic building and implementation of vibration minimization approaches (Construction Noise Approach 3, below) would be necessary.

While vibratory pile driving (or similar continuous vibration sources) can reduce the potential impacts to fragile structures that can occur with impact pile driving, (where higher intermittent vibration levels can occur when the hammer strikes the pile), continuous vibration also can cause liquefaction (or differential settlement in sandy soils), due to the continuous nature of the vibration. AASHTO[26] states "Saturated, loose, uniformly or poorly graded sands and silts are sensitive to cyclic vibration such as might be

[26] American Association of State Highway Transportation Officials (AASHTO). *Evaluation of Transportation-Related Earthborne Vibrations,* R 8-96, 2004.

produced by vibratory pile driving. These activities can produce noticeable settlement even at low vibration levels (0.1 to 0.7 in/sec), which are known not to produce threshold cracking." Evaluation of this potential, enforcement of an appropriate vibration limit, and using smaller equipment or pre-drilling pile holes, as specified in Construction Noise Approach 3 below, would minimize the potential for structural damage from vibration-induced liquefaction. [27]

Operational Noise and Vibration

Operation of the Proposed Project would increase ambient noise levels in the project vicinity, primarily through the on-site use of stationary equipment, such as emergency generators, heating/ ventilation/ air conditioning systems, a below-grade wastewater pump station (new 20th Street pump station), outdoor activities in open space areas, and Project-related traffic increases in traffic.

Stationary Equipment

Project implementation would add new mechanical equipment, such as heating/ventilation/air conditioning (HVAC) systems, which could produce operational noise. Operation of HVAC equipment would be subject to the City's Noise Ordinance (Article 29 of the San Francisco Police Code). Under Section 2909, stationary sources are not permitted to result in noise levels that exceed the existing ambient (L_{90}) noise level by more than 5 dBA on residential property, 8 dBA on commercial and industrial property and 10 dBA on public property. Section 2909(d) states that no fixed noise source may cause the noise level measured inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dBA between 10:00 p.m. and 7:00 a.m. or 55 dBA between 7 a.m. and 10 p.m. with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

Based on noise measurements collected on the project site and its vicinity (see noise measurement data in Attachment 1), the existing daytime ambient (L_{90}) noise levels range between 44 and 58 dBA near the western boundary of the Illinois Parcels (LT-4 and LT-6) and between 57 and 62 dBA (LT-2) on the 28-Acre Site range. Section 2909 of the *Police Code* would allow mechanical equipment to generate up to 8 dB higher than the lowest ambient (or up to 52 dBA, L_{90}) near the western boundary of the Illinois Parcels and up to 8 dB higher (or up to 65 dBA, L_{90}) near the 28-Acre Site northern boundary. Depending on size, noise from HVAC equipment can generate noise levels of up to 75 dBA (L_{90}) at 30 feet.[28] Assuming HVAC equipment operates 24 hours per day (worst-case), such noise levels would exceed ordinance noise limits if this equipment is placed near parcel boundaries. However, with incorporation of noise attenuation measures (e.g., provision of sound enclosures/barriers, addition of roof parapets to block noise, and increasing setback distances from sensitive receptors), as recommended in Noise Compatibility Approach 1, Stationary Equipment Noise Controls, HVAC-related noise would be reduced to ordinance

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[27] The Proposed Project would likely include the installation of below-grade secant pile walls along the northeastern and southeastern portions of the project site on either side of the craneways to prevent lateral spread from occurring.

[28] Based on specifications for HVAC units provided by vendors and adjusted by Orion Environmental Associates.

noise limits (52 dBA) at the western boundary of the Illinois Parcels, and this reduced noise level would attenuate to below 30 dBA at the closest existing sensitive receptors (140 to 200 feet away). With windows open, interior noise levels would be even lower and well below the 45-dBA nighttime interior noise limit (with windows open) specified in Section 2909. Other nearby sensitive receptors to the west, northwest, and southwest are located farther away and noise levels from Project mechanical equipment would be less. Intervening buildings would also interrupt any direct lines-of-sight between these more distant receptors and rooftop noise sources.

With respect to on-site Project residences, an interior noise level of 45 dBA (L_{dn} or CNEL) would be required by the Title 24 of the California Building Code, and design of Proposed Project residences (under either the Maximum Residential or Maximum Commercial scenarios) would need to account for not only existing noise sources, as required by Title 24, but also future noise sources known at the time of development (including HVAC systems). Therefore, incorporation of noise attenuation measures outlined in Noise Compatibility Approach 1, Stationary Equipment Noise Controls, would ensure compliance with Section 2909 of the *Police Code* in the interiors of Project residential units under both existing and future noise conditions, and also ensure that Project-related noise increases associated with stationary equipment would be reduced to acceptable levels at nearby sensitive receptors.

Emergency generators would be required on at least 11 of the proposed buildings or parcels where building heights would exceed 70 feet under both the Maximum Residential and Maximum Commercial scenarios as well as at the proposed pump station. The only exception would be Parcel E1, which would not require an emergency generator under the Maximum Commercial scenario because the building on this parcel would be 65 feet high under this scenario. These parcels are located along the northern (A, B, D, and E1) and southern (F, G, H1, and H2) Project boundaries, as well as in the center of the site and just east of Irish Hill (C1 and C2). The closest existing off-site sensitive receptors would be located 700 feet or more from the closest of these buildings (C1). The emergency generators would create temporary noise from use during a power failure, could periodically result in temporary noise during testing to ensure their continued reliability, and could operate continuously following a catastrophic emergency until electric power service is restored to the area. Emergency generators typically operate for approximately 1 hour per week (50 hours per year) and such a short noise event would not substantially alter ambient noise levels. Depending on the size, emergency generators can generate noise levels of 75 to 80 dBA (L_{eq}) at 50 feet[29] and the L_{90} noise level would be similar to the L_{eq} level due to the continuous nature of generator noise (i.e., during testing generators could operate continuously for an entire hour so the L_{eq} and L_{90} would be approximately the same during that hour). Although there are no existing off-site sensitive receptors within 700 feet of parcels that could contain buildings requiring generators, some of the Proposed Project buildings where emergency generators would be located would be developed with residential uses. Therefore, the Proposed Project's residential receptors could be located as close as 50 feet from these

[29] U.S. Federal Highway Administration (FHWA), *Construction Noise Handbook, Table 9-1, RCNM Default Noise Emission Reference Levels and Usage Factors.* Available online at http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm. Accessed on December 16, 2016.

buildings/parcels. At this distance, noise levels generated by operation of emergency generators would exceed noise limits specified in Section 2909(d) of the Police Code (55 dBA from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10:00 p.m. to 7:00 a.m. inside any sleeping or living room in any dwelling unit located on residential property). Incorporation of noise attenuation measures outlined in Noise Compatibility Approach 1, Stationary Equipment Noise Controls, would also ensure these ordinance limits would be met.

A wastewater pump station (the 20th Street Pump Station) and at-grade electrical transformers are proposed to be located to the north of the 28-Acre Site between Buildings 108 and Building 6. Pumps associated with the pump station would be located below grade, while other pump station facilities and transformers would be above grade. Noise increases resulting from these new facilities would ultimately depend on the number and size of pumps, the size and type of transformers, extent of noise attenuation features incorporated into the facility design, ambient noise levels in the vicinity, and proximity to sensitive receptors. Although pump noise can be highly variable, below-grade pumps are estimated to generate approximately 52 dBA (L_{eq} or L_{90}, due to the continuous nature of pump noise when operating) at 25 feet from any vent openings to the below-grade pump station structure.[30] In the same vicinity, transformers (up to 1,000 kilovolt amps) could generate noise levels of up to 38 to 44 dBA (L_{eq} or L_{90}, due to the continuous nature of transformer noise) at 25 feet, depending on the type of type of transformer (liquid immersed vs. dry-type).[31] As indicated in Table 6 (Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring in the Project Mixed-Use District Vicinity), daytime L_{90} noise levels in this vicinity (LT-3) were measured to range from 52 to 58 dBA (L_{90}), and therefore, combined noise generated by these facilities (53 dBA, L_{90}) would have a slight potential to exceed ambient noise levels at times in this vicinity. Existing industrial uses (BAE Systems Ship Repair) and proposed commercial uses (under both the Maximum Residential and Maximum Commercial scenarios) would be located adjacent to this facility, and Section 2909(b) would limit noise increases adjacent to such uses to 8 dBA above ambient (L_{90}). Whether or not future noise levels exceed ordinance noise limits will ultimately depend the size and design of the proposed wastewater pump station facilities as well as ambient noise levels at the closest property plane for the pump station. Given the range of existing ambient noise levels in the pump station vicinity, addition of the proposed pump station is conservatively considered to have the potential to slightly exceed ordinance noise limits. Incorporation of supplemental noise attenuation measures (e.g., installing louvered vent openings, locating vent opening away from adjacent commercial uses, and providing a noise barrier around the transformers, as necessary) outlined in Noise Compatibility Approach 1, Stationary Equipment Noise Controls, would ensure compliance with Section 2909 of the *Police Code.* Compliance with this ordinance limit would ensure that Project-related noise increases from

[30] This level assumes that the interior level will not exceed 85 dBA (to avoid the need for OSHA worker hearing protection) and the building/enclosure reduces interior noise levels by 20 dBA at vent openings (conservative since most enclosures can provide at least 25 dB reductions), so that the exterior noise level at 6 feet from the vent opening is 65 dBA.

[31] Transformer noise levels were estimated based on National Electrical Manufacturers Association standards (NEMA, *NEMA TR 1-2013, Transformers, Step Voltage Regulators and Reactors,* p. 4, 2014; NEMA *Transformers, Regulators and Reactors, No. TR 1,* p. 4, 1994. Since distance is not specified in NEMA standards, for the purpose of this analysis, levels were assumed to be a near-field noise level at 5 feet and then converted to a far-field noise level at 50 feet by applying a 20-dB reduction.

this pump station would be maintained at acceptable levels at existing industrial uses, proposed commercial uses, and more distant proposed residential uses.

Noise Compatibility of Future Uses

Development of commercial-office uses in proximity to existing residential uses would increase the potential for noise disturbance or conflicts. Sources of noise typically associated with such non-residential uses that can cause sleep disturbance include mechanical equipment, delivery trucks and associated loading areas, parking cars and use of refuse bins. Mechanical equipment (stationary noise sources) can include emergency generators as well as refrigeration and HVAC units, and associated noise impacts from these sources are discussed above.

With respect to delivery trucks, if deliveries and associated unloading/loading activities occur in proximity to future residential buildings and during the nighttime hours, future residents could be subject to sleep disturbance by noise from these activities. Noise typically associated with delivery trucks include trucks maneuvering in and out of designated loading areas, audible warnings when trucks reverse into loading areas, idling during deliveries, opening and closing of truck doors and rollup doors, use of rolling hand carts and dollies, and engines starting. There would be a potential for sleep disturbance from these types of noise under both scenarios, because all future commercial-office or RALI buildings would be located adjacent to one or more residential buildings (as close as 23 to 38 feet in some instances). The California Air Resources Board limits the idling of diesel trucks (over 10,000 pounds) to no more than 5 minutes, and this rule would help minimize truck idling noise in loading areas. Audible warnings are required by Cal-OSHA to be at least 5 dBA above ambient noise levels. These devices are highly directional in nature, and when in reverse the trucks and the warning alarm would be directed towards the loading area and adjacent commercial-office structures. Audible warnings are, of course, intended to warn persons who are behind the vehicle when it is backing up, and could cause sleep disturbance if they occur during the nighttime (including early morning) hours near residential uses. However, locating loading areas on the sides of commercial-office buildings that face away from residential buildings to the extent feasible or designing loading areas with noise shielding (preferably enclosures) or restricting these activities to the daytime hours (7:00 a.m. to 8:00 p.m.) would reduce the potential for sleep disturbance of future residents from this noise source (see Noise Compatibility Approach 2, Design of Future Noise-Generating Uses, below).

Noise associated with parking cars include engines starting and car doors slamming. Such noise can cause annoyance at adjacent residential uses if they are concentrated in one area (i.e., a surface parking lot is located adjacent to residences), and if it occurs during the evening or nighttime hours, it could cause sleep disturbance. Parking for each Project building is proposed to be located under the building (below grade parking) or in a parking garage. These types of parking facilities could be designed to avoid or minimize the potential for such noise disturbance or annoyance at future residences assuming appropriate noise shielding measures are incorporated into any future parking garages to comply with ordinance limits (see Noise Compatibility Approach 2, Design of Future Noise-Generating Uses, below).

Noise associated with trash or refuse facilities for both future residential and commercial-office uses could disturb or annoy any future nearby residents. Such noise is typically associated with trash dumping activities, operation of trash compactors and garbage truck collection activities (including truck noise, operation of motors that lift trash containers, banging of containers during trash collection activities and audible warnings when trucks reverse).

As indicated above (see Operational Noise and Vibration, Stationary Equipment), *Police Code* Section 2909 limits noise increases from fixed (stationary) mechanical equipment associated with each Project building (residential or commercial-office) to 5 dBA from residential sources and 8 dBA for commercial-office sources, and this requirement would limit the potential for noise compatibility problems. However, there are no similar code restrictions or noise limits that restrict activities such as these (i.e., parking structures, loading docks, and trash bins) that are related to commercial-office uses. Implementation of noise avoidance or minimization practices through the design of both future commercial-office and residential buildings (Noise Compatibility Approaches 2, Design of Future Noise-Generating Uses, and 3, Design of Future Noise-Sensitive Uses, below) to the maximum extent feasible would help reduce potential conflicts between future noise-generating uses and residential receptors and the potential for sleep disturbance. Noise Compatibility Approach 3, Design of Future Noise-Sensitive Uses, would require a site-specific noise evaluation for each residential parcel or building to be developed to ensure that applicable interior noise standards are met, and the evaluation is required to account for planned commercial-office and open space uses in adjacent areas, future variations in Project buildout (building heights, location, and phasing), any changes in activities adjacent to or near the Illinois Parcels or 28-Acre Site (given the Proposed Project's long buildout period), and any shielding provided by surrounding buildings that exist at the time of development. In addition, implementation of noise minimization approaches in the design of noise-generating uses such as loading docks, trash enclosures, surface parking lots, and mechanical equipment evaluation (see Noise Compatibility Approach 2, Design of Future Noise-Generating Uses, below) would ensure that new sources of noise associated with development of new non-residential uses are properly evaluated and potential sleep disturbance effects ameliorated, so that potential conflicts between new noise-generating uses and existing noise-sensitive uses can be minimized or avoided.

Traffic Noise

Operation of the Proposed Project would result in permanent increases in ambient noise levels, primarily through Project-related increases in traffic. Traffic increases associated with the Proposed Project would result in traffic noise increases along local streets. In general, traffic noise increases of less than 3 dBA are barely perceptible to people, while a 5-dBA increase is readily noticeable.[32] Therefore, permanent

[32] California Department of Transportation, Division of Environmental Analysis, "Technical Noise Supplement," November 2009; pp. 2-48 – 2-49. Available online at http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf.

increases in ambient noise levels of less than 5 dBA are typically considered to be acceptable, except in circumstances in which the resulting noise environment is relatively loud. Some guidance thresholds for determining when changes in ambient noise levels are considered substantial is provided by the San Francisco Land Use Compatibility Chart for Community Noise. The City considers a traffic noise increase to be substantial if it exceeds the following threshold levels: (1) any increase that exceeds 5 dBA regardless of the affected land use; and (2) any increase that exceeds 3 dBA in places where the existing or resulting noise environment at the affected land use is "Conditionally Acceptable," "Conditionally Unacceptable," or "Unacceptable" for noise-sensitive uses based the San Francisco Land Use Compatibility Chart for Community Noise (Figure 7).

Noise modeling was completed to estimate existing (baseline) and future traffic noise levels along 79 road segments in the project vicinity and they were modeled using traffic volumes presented in the *Pier 70 Traffic Impact Study* (TIS).[33] Noise modeling results are presented in **Table 12, Summary of Existing and Existing Plus Project Traffic Noise Levels**. Traffic noise levels presented in this table have been modeled for the purpose of identifying the future incremental noise level increases attributable to Project and cumulative development.

Table 12 (Summary of Existing Traffic Noise Levels) indicates that Proposed Project implementation (under both the Maximum Residential and Maximum Commercial scenarios) would result in traffic noise increases ranging from 0 to 14 dBA on local roadways providing access to the site. Of the 79 road segments examined, traffic noise increases on all analyzed street segments would not exceed the above guidance thresholds except for the following:

- 20th Street (east of Third Street to east of Illinois Street)
- 22nd Street (east of Tennessee Street to east of Illinois Street)
- Illinois Street (20th Street to south of 22nd Street)

These street segments either directly adjoin the project site or are within two blocks of the project site and provide direct access to the site. As shown in Table 12, existing land uses located adjacent to all but one of the above-listed street segments are currently industrial, and such uses are not considered sensitive to traffic noise increases (i.e., not noise-sensitive receptors). There is one street segment, 22nd Street between Tennessee Street and Third Street where there are residential uses and the resulting noise level is estimated to slightly exceed 60 dBA (L_{dn} or CNEL) and the incremental increase attributable to the Proposed Project would be 3.2 dBA, 0.2 dBA above the guidance threshold.

[33] Fehr & Peers, Pier 70 Mixed-Use District Project Transportation Impact Study, 2016. A copy of this report is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2014.001272ENV.

Table 12: Summary of Existing and Existing Plus Project Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
Third Street	North of Harrison	67.1	67.4	0.4	67.5	0.4	Res/Com/Off
	Harrison to Bryant	67.8	68.1	0.3	68.1	0.4	Res/Com/Ind
	South of Bryant	67.5	68.0	0.5	68.1	0.6	Res/Com/Ind
	North of King	67.3	67.9	0.5	67.9	0.6	Res/Com
	King to Terry Francois	66.3	67.3	1.0	67.4	1.1	Ballpark/Res
	Terry Francois to Channel	65.6	66.8	1.1	66.9	1.2	Vacant/Parking
	Channel to Mission Rock	65.5	66.7	1.2	66.8	1.3	Res/Parking
	South of Mission Rock	65.3	66.6	1.3	66.7	1.4	UCSF/Inst/Res
	North of 16th	66.2	67.5	1.2	67.6	1.3	UCSF/Inst
	16th to Mariposa	66.4	67.9	1.5	67.9	1.5	Hospital/Ind
	Mariposa-20th	65.5	66.9	1.4	66.9	1.4	Res/Com/Ind
	20th to 22nd	66.0	67.3	1.3	67.5	1.4	Res/Com/Ind
	22nd to 23rd	66.4	67.9	1.5	58.8	1.5	Com/Res
	23rd to 25th	66.2	68.5	2.3	68.5	2.3	Ind
	25th to Cesar Chavez	66.3	68.1	1.8	68.0	1.8	Com/Ind
	South of Cesar Chavez	65.6	66.1	0.5	66.1	0.5	Ind
16th Street	West of Mississippi	64.5	65.3	0.8	65.3	0.8	Com/Ind
	East of Mississippi	65.7	66.6	0.9	66.5	0.8	Com/Ind
	West of Owens	65.7	66.5	0.9	66.5	0.8	UCSF/Inst.
	East of Owens	65.9	66.8	0.9	66.8	0.9	UCSF/Inst.
	West of Third	65.4	66.9	1.5	66.8	1.4	UCSF/Hospital
	East of Third	60.0	62.2	2.3	62.3	2.3	UCSF/Inst.

Table 12: Summary of Existing and Existing Plus Project Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
18th Street	West of Arkansas	54.7	55.6	0.9	55.6	0.9	Res/Ind
	East of Arkansas	55.4	56.2	0.8	56.2	0.8	Res/Com
	West of Texas	58.3	58.8	0.4	58.8	0.4	Res/Com
	Texas to Pennsylvania	58.5	58.8	0.3	58.8	0.3	Res/Com
	East of Pennsylvania	59.0	60.4	1.3	60.2	1.1	Off/Com
	West of Indiana	59.0	60.4	1.3	60.2	1.1	Ind
	East of Indiana	59.2	61.2	2.0	61.2	2.0	Ind
20th Street	West of Third	58.9	60.0	1.1	60.0	1.1	Res/Ind
	East of Third	59.7	65.1	**5.5**	65.2	**5.5**	Ind
	West of Illinois	59.6	65.0	**5.5**	65.1	**5.5**	Ind
	East of Illinois	62.4	67.1	4.6	67.0	4.6	Ind
22nd Street	West of Indiana	59.4	62.1	2.7	62.1	2.7	Ind
	Indiana to Tennessee	58.8	61.8	3.0	61.8	3.0	Res
	Tennessee to Third	58.4	61.6	**3.2**	61.6	**3.2**	Com/**Res**
	East of Third	58.5	66.9	**8.4**	66.7	**8.2**	Ind
	West of Illinois	58.1	66.9	**8.7**	66.7	**8.6**	Ind
	East of Illinois	51.1	65.4	**14.3**	65.4	**14.3**	Ind
23rd Street	West of Third	56.5	60.0	3.5	60.0	3.4	Ind
	East of Third	54.9	58.7	3.8	58.8	3.8	Ind
	West of Illinois	53.6	58.2	4.6	58.2	4.7	Ind
	East of Illinois	50.9	50.9	0.0	50.9	0.0	Ind

Table 12: Summary of Existing and Existing Plus Project Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
25th Street	West of Pennsylvania	56.5	56.5	0.0	56.5	0.0	Res
	East of Pennsylvania	59.4	61.7	2.3	61.8	2.3	Ind
	West of Indiana	59.3	61.6	2.3	61.7	2.4	Ind
	East of Indiana	59.4	61.7	2.3	61.8	2.3	Ind
	West of Third	57.4	61.7	4.4	62.0	4.6	Ind
	East of Third	53.0	57.9	4.8	58.4	5.4	Ind
	West of Illinois	54.0	58.2	4.2	58.7	4.7	Ind
	East of Illinois	49.5	49.5	0.0	49.5	0.0	Ind
Cesar Chavez	West of Pennsylvania	65.1	66.4	1.3	66.4	1.3	Ind
	East of Pennsylvania	64.6	67.2	2.6	67.2	2.6	Ind
	West of Third	63.4	66.6	3.2	66.6	3.2	Ind
	East of Third	58.2	62.5	4.3	62.5	4.3	Ind
Arkansas Street	North of 18th	54.9	54.9	0.0	54.9	0.0	Res/Ind
	South of 18th	54.2	54.2	0.0	54.2	0.0	Res
Future Driveway	East of Illinois	NA	65.2	NA	65.2	NA	Ind
Illinois Street	North of Mariposa	56.8	59.9	3.1	59.9	3.1	Vacant/UCSF
	Mariposa-19th	59.9	62.9	3.0	62.9	3.0	Res/Com/Ind
	19th to 20th	60.4	63.4	3.0	63.4	3.0	Res/Com/Ind
	20th to Driveway	58.9	64.7	**5.7**	64.4	**5.5**	Ind
	Driveway to 22nd	58.9	65.9	**7.0**	65.8	**6.9**	Ind
	South of 22nd	57.6	63.2	**5.7**	63.4	**5.8**	Ind
Indiana Street	North of 22nd	54.1	54.1	0.0	54.1	0.0	Com/Ind
	South of 22nd	54.6	54.6	0.0	54.6	0.0	Ind
	North of 25th	58.6	60.3	1.7	60.6	1.9	Ind/Res
	South of 25th	57.5	57.5	0.0	57.5	0.0	Ind/Res

Table 12: Summary of Existing and Existing Plus Project Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline					Existing Use
		Baseline (2020)	With Project (Max Res)	Project Change (Max Res)	With Project (Max Com)	Project Change (Max Com)	
Mariposa Street	West of I-280 Ramp	63.8	63.9	0.1	63.9	0.1	Ind/Res
	East of I-280 Ramp	65.6	65.9	0.4	66.0	0.4	Ind
	East of Indiana	63.4	64.1	0.7	64.1	0.7	Ind
	West of Third	62.5	63.3	0.8	63.3	0.8	Ind/Res
	East of Third	60.3	61.5	1.2	61.5	1.2	Ind
	West of Illinois	60.2	61.4	1.2	61.4	1.2	Ind
	East of Illinois	59.6	59.6	0.0	59.6	0.0	Ind
Tennessee Street	North of 22nd	53.4	53.4	0.0	53.4	0.0	Com/Res
	South of 22nd	49.7	49.7	0.0	49.7	0.0	Res/Com
Texas Street	North of 18th	52.6	52.6	0.0	52.6	0.0	Res
	South of 18th	51.5	51.5	0.0	51.5	0.0	Res

Notes: Noise levels may vary by up to one-tenth of a decibel due to rounding. Noise levels in **bold** exceed either of the following threshold increases when compared to baseline noise levels: (1) an increase of 5 dBA or more, or (2) an increase of 3 dBA or more in areas where the existing or resulting noise increase exceeds acceptable (or satisfactory) levels for the affected use (see Figure 7, San Francisco Land Use Compatibility Chart for Community Noise).

Res: Residential; Com: Commercial; Off: Office; Ind: Industrial; Inst: Institutional; UCSF: University of California, San Francisco

Traffic noise modeling was completed using the Federal Highway Administration RD-77-108 model. Assumptions include: Travel speeds on all streets, 25 mph, except on 16th, Third, and Cesar Chavez, where the posted speed limit is 30 mph; Vehicle Mix: 98% Autos/1.5% Medium Trucks/0.5% Heavy Trucks; Day-Night Split: 76% Day (7:00 a.m. to 7:00 p.m.), 12% Evening (7:00 p.m. to 10:00 p.m.), and 12% Night (10:00 p.m. to 7:00 a.m.). Background noise levels due to traffic on other roadways (such as cross-streets or nearby freeways) and non-traffic-related activities are not reflected in these noise levels. Noise levels in this table are intended to indicate incremental noise changes due to Project implementation and future growth. Since they do not include background noise levels, they may not necessarily reflect actual noise levels along these roadway segments if there are other nearby sources of noise. Changes between scenarios analyzed may not show change due to rounding in the noise modeling results.

Source: Orion Environmental Associates, 2016

The Proposed Project would include a shuttle service, operated and maintained by the Pier 70 TMA, to connect the Pier 70 Mixed-Use District to regional transit hubs. The primary goal of the proposed shuttle service at Pier 70 is to provide a first-mile / last-mile connection for transit riders traveling to or from the project site, particularly for riders needing to use frequent local and regional transit. These riders would be expected to take regional transit services operated by BART, Caltrain, Alameda-Contra Costa Transit (AC Transit, Golden Gate Transit, San Mateo County Transit (SamTrans), or other regional transit providers, but would need an additional connection to access these services when traveling to or from Pier 70. The exact structure of any shuttle service provided for the project site has not been established and would depend on factors that are not known at this time. For planning and analysis purposes, two routes have been preliminarily identified; however, final service routes and stops would be determined based on rider feedback and demand, peak period traffic congestion on local streets, and BART and Caltrain schedules and service plans at specific stations. The two preliminary routes assumed for this analysis are:

- 22nd Street, Mississippi Street, and 16th Street to access the 22nd Street Caltrain Station and the 16th Street / Mission BART station; and
- Third Street, 16th Street, and King Street to access the Fourth and King Caltrain Station (with some trips extending to the Transbay Transit Center)

An increase in shuttle bus volumes along these routes would incrementally increase traffic noise levels along these streets. However, the degree of impact would depend on bus sizes, frequency of buses on an hourly basis, and hours of operation. Since some of the above streets have residential uses and existing noise levels on these street segments range from 50 dBA to over 70 dBA (L_{dn}), it is possible that bus traffic noise increases along some of the quieter residential streets (i.e., Mississippi Street where there are no bus lines) could be noticeable. Such potential noise increases could be reduced by using smaller or quieter shuttle buses, using streets with no residential uses, and avoiding more noise-sensitive nighttime hours.

Implementation of Transportation Demand Management measures, which are designed to achieve a performance standard that reduces Project-related one-way traffic by up to 20 percent (see Noise Compatibility Approach 4, Transportation Demand Management, below) could reduce noise levels by up to 1.0 dB. Such reductions would reduce the above noise increases to below the guidance thresholds at all of the above street segments except for three road segments:

- 22nd Street from Third Street to Illinois Street;
- 22nd Street east of Illinois Street (on the project site); and
- Illinois Street from the future 21st Street and 22nd Street (adjacent to the project site).

The one-block section of 22nd Street located off-site is developed with industrial uses and therefore, does not have noise-sensitive receptors. Project residences located adjacent to the section of 22nd Street east of Illinois Street (where the highest increase [14 dBA] is projected to occur) and the section of Illinois Street between the future 21st and 22nd Streets (where the next highest increase [7 dBA] is projected to occur) would not be adversely affected by future noise levels since Project units could be designed to

ensure that interior noise levels are maintained at acceptable levels even with future traffic noise level increases. While such TDM measures would reduce the effects of Project-related traffic noise increases on the interior environment of future uses, the Proposed Project's traffic would still result in noise levels that would cause a substantial permanent increase in ambient noise levels.

Groundborne Vibration and Noise

Operational-related ground-borne vibration is not a common environmental problem and even large vehicles (e.g., trucks and buses) do not generally result in perceptible vibration. Therefore, no long-term vibration effects are expected to be associated proposed residential, commercial and RALI uses under both the Maximum Residential and Maximum Commercial scenarios.

Operation of pumps at the below-ground or enclosed wastewater pump station would have the potential to generate groundborne vibration that could cause sleep disturbance during the more sensitive nighttime hours if residential receptors are located nearby. However, vibration generated by pump station equipment can affect other equipment within the pump station if vibration levels are not controlled adequately. Therefore, controls that are already incorporated into the design to prevent damage to pump station equipment from excessive vibration would also be sufficient to avoid operational vibration levels from causing sleep disturbance at the closest residential receptors (located a minimum of 375 feet away) and cosmetic damage of adjacent Project structures (located at least 75 feet away).

Noise Compatibility with the Future Noise Environment

As indicated above, construction and operation of the Proposed Project would result in substantial short- and long-term noise increases at the project site and its immediate vicinity. Therefore, the impact of these increases on future residents or users of the project site is evaluated below.[34] Besides residential uses, future users of the site include open space/park/playground, commercial, and RALI uses. Open space/park/playground users in urban areas, commercial uses, and RALI uses are not considered to be sensitive to noise, and therefore, noise compatibility of these uses is not considered to be an adverse impact. Noise compatibility of all proposed uses is evaluated in **Table 13, Noise Compatibility by Parcel - Maximum Residential Scenario,** and **Table 14, Noise Compatibility by Parcel - Maximum Commercial Scenario,** but where noise levels are considered Conditionally Acceptable for a proposed use, it is not considered an adverse impact unless the use is residential because residential uses are the only proposed land use that are noise-sensitive.

[34] In *California Building Industry Association v. Bay Area Air Quality Management District*, the California Supreme Court concluded that CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents unless a proposed project risks exacerbating an existing environmental hazard or condition. In that case, the potential impact of such hazards on future residents or users should be evaluated.

Table 13: Noise Compatibility By Parcel - Maximum Residential Scenario

Project Parcel/ Building	Max Res Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
28-Acre Site[2]						
Parcel A	Com-Office	90	60-66 dBA	60-70 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}).	N/A
Parcel B	Com-Office	90	60-66 dBA	65-69 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}).	N/A
Parcel C1	Com-Office or Residential	90	58-66 dBA	58-71 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}) except Conditionally Acceptable on north façade (71-75 dBA, L_{dn}) or Conditionally Acceptable for residential uses (>60 dBA, Ldn).	N/A or Yes (#3)
	or Parking			58-71 dBA	Parking use is not subject to City noise guidelines, but potential noise conflicts with adjacent residential uses.	N/A
Parcel C2	Residential	90	58-66 dBA	58-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}).	Yes (#3)
	or Parking	90	58-66 dBA	58-70 dBA	Parking use is not subject to City noise guidelines, but potential for disturbance of adjacent residents from noise associated with parking activities.	N/A
Parcel D	Residential	90	66 dBA	66-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (L_{eq}) and 60-69 dBA (L_{max}). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	Yes (#3)
Parcel E1	Residential	90	66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (L_{eq}) and 60-69 dBA (L_{max}). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (#3)
Parcel E2	Residential	70	58-66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}).	Yes (#3)
Parcel E3	Residential	70	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}).	Yes (#3)

Table 13: Noise Compatibility By Parcel - Maximum Residential Scenario

Project Parcel/ Building	Max Res Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
Parcel F	Residential	90	58-66 dBA	58-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (#3)
Parcel G	Residential	90	58-66 dBA	58-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (#3)
Parcel H1	Residential	90	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (#3)
Parcel H2	Residential	90	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	Yes (#3)
Building 2	Residential	Same Ht.	66 dBA	66-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Project residences would be subject to shipyard noise with	Yes (#3)

Table 13: Noise Compatibility By Parcel - Maximum Residential Scenario

Project Parcel/ Building	Max Res Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
					measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard noise at this parcel during early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard noise, depending on phasing.	
Parcel E4	RALI	50	66 dBA	66-69 dBA	Acceptable for RALI uses (≤70 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Building 12	RALI	Same Ht.	58-66 dBA	58-69 dBA	Acceptable for RALI uses (≤70 dBA, L_{dn}) but potential noise conflicts with adjacent residential uses.	N/A
Building 21	RALI	Same Ht.	66 dBA	66 dBA	Acceptable for RALI uses (≤70 dBA, L_{dn}) but potential noise conflicts with adjacent residential uses.	N/A
Parcel C1 Rooftop	Parks/Sport Courts	NA	58-66 dBA	58-71 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}) except Conditionally Acceptable only on C1 immediately adjacent to 21st Street (71-77.5 dBA, L_{dn}).	N/A
Parcel C2 Rooftop	Parks/Sport Courts	NA	58-66 dBA	58-70 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}).	N/A
Waterfront Promenade	Open Space/Parks	NA	58-66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, L_{dn}).	N/A
Waterfront Terrace	Open Space/Parks	NA	66 dBA	58-68 dBA	Acceptable for water-related recreational uses (≤75 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Slipway Commons	Open Space/Parks	NA	66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Building 12 Market Plaza/ Square	Open Space/Parks	NA	66 dBA	66-68 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Illinois Parcels[3]						
Parcel PKN	Residential	65	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}), and new residential construction generally discouraged on south façade (>70 dBA, L_{dn}), but acceptable interior levels can still be achieved with supplemental noise-reduction measures. Project residences on west side would be subject to noise generated by AIC with	Yes (#3)

Table 13: Noise Compatibility By Parcel - Maximum Residential Scenario

Project Parcel/ Building	Max Res Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
					maximum exterior noise levels up to 77 dBA (L_{max}), averaging 70 dBA (L_{max}) during the nighttime hours.	
Parcel PKS	Residential	65	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}), and new residential construction generally discouraged on north façade (>70 dBA, L_{dn}), but acceptable interior levels can still be achieved with supplemental noise-reduction measures. Project residences on west side would be subject to noise generated by AIC with maximum exterior noise levels up to 77 dBA (L_{max}), averaging 70 dBA (L_{max}) during the nighttime hours.	Yes (#3)
Hoedown Yard (HDY1/2)	Residential	65	62-64 dBA[4]	62-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Project residences on west side would be subject to noise generated by AIC (up to 77 dBA, L_{max}, averaging 70 dBA, L_{max}) to the west and Potrero Substation to the south (increased ambient of 10 to 13 dBA, L_{eq}, at 200 feet).[5]	Yes (#3)
20th Street Plaza	Open Space/Parks	NA	62-64 dBA	62-71 dBA	Acceptable for playgrounds/parks ($\leq$70 dBA, L_{dn}) except Conditionally Acceptable on north side (71-77.5 dBA, L_{dn}).	N/A
Irish Hill Playground	Open Space/ Parks	NA	62-64 dBA	62-72 dBA	Acceptable for playgrounds/parks ($\leq$70 dBA, L_{dn}), but Conditionally Acceptable on north side adjacent to 21st Street (71-77.5 dBA, L_{dn})	N/A

Notes: N/A = Not applicable and no mitigation required because it is not a noise-sensitive use. As indicated in the Setting above, closed windows reduce noise levels by approximately 25 dBA, while open windows reduce noise levels by about 15 dBA.

[1] Traffic noise levels were first estimated for each Project roadway based on future estimated traffic volumes, and then adjusted for distance to the edge of the road rights-of-way to represent the maximum noise level at closest possible location of a building façade. Noise levels by façade are listed for each parcel and building on the project site in **Attachment 2: Project On-Site Noise Exposure by Parcel.** The above table summarizes these estimates by presenting the lowest and highest combined noise levels for each parcel at the edge of the adjacent or closest road rights-of-way.

[2] All 28-Acre Site parcels except existing Buildings 2, 12, and 21 would be permitted to include accessory parking. Also RALI uses would be allowed on the ground floor of Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, and H2.

[3] Retail/Restaurant uses would be allowed on the ground floor and accessory parking proposed on all four parcels.

[4] Ambient noise levels for Parcel HDY are estimated based on measurements collected along Illinois to the north because measurements at Parcel HDY included noise from heavy equipment operations associated with the existing PG&E corporation yard activities in the Hoedown Yard. These operations would cease on this parcel when this parcel is redeveloped as part of Project implementation, but transformer noise from the Potrero Substation would continue.

[5] When measured L90 levels between midnight and 4:00 a.m. are compared between LT-6 and LT-7 (same distance to Illinois except LT-7 is located 200 feet from the Potrero Substation to the south), the difference in nighttime ambient was 10 to 13 dBA, which could be attributable to the Potrero Substation.

Source: Orion Environmental Associates, 2016

Table 14: Noise Compatibility By Parcel - Maximum Commercial Scenario

Project Parcel/ Building	Max Com Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
28-Acre Site[2]						
Parcel A	Com-Office	90	62-66 dBA	62-70 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}).	N/A
Parcel B1	Com-Office	90	62-66 dBA	66-69 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}).	N/A
Parcel C1	Com-Office	90	58-66 dBA	58-71 dBA	Acceptable for commercial-office uses (≤70 dBA, Ldn) except Conditionally Acceptable on north façade (70-75 dBA, Ldn)..	N/A
	or Parking			58-71 dBA	Parking use not subject to City noise guidelines, but potential noise conflicts with adjacent residential uses.	N/A
Parcel C2	Residential	90	58-66 dBA	58-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}).	Yes (#3)
	or Parking	90	58-66 dBA	58-70 dBA	Parking use not subject to City noise guidelines, but potential noise conflicts with adjacent residential uses..	N/A
Parcel D	Residential	90	66 dBA	66-70 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	Yes (#3)
Parcel E1	Residential	90	66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}). Project residences would be subject to shipyard noise with measured nighttime levels of 58-64 dBA (Leq) and 60-69 dBA (Lmax). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	Yes (#3)
Parcel E2	Residential	70	58-66 dBA	66-69 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}).	Yes (#3)
Parcel E3	Residential	70	58-66 dBA	58-68 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}).	Yes (#3)

Table 14: Noise Compatibility By Parcel - Maximum Commercial Scenario

Project Parcel/ Building	Max Com Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
Parcel F	Com-Office	90	58-66 dBA	58-70 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel G	Com-Office	90	58-66 dBA	58-69 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel H1	Com-Office	90	58-66 dBA	58-68 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel H2	Com-Office	90	58-66 dBA	58-68 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but building rehabilitation and new construction in the northern and central portions of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A

Table 14: Noise Compatibility By Parcel - Maximum Commercial Scenario

Project Parcel/ Building	Max Com Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
Building 2	Com-Office	Same Ht.	66 dBA	66-70 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}). Proposed building demolition could increase shipyard-related noise at this parcel during the early phases by creating a more direct line of sight between residential uses and BAE ship repair activities, but new construction in the northern portion of the 28-Acre Site could ultimately result in offsetting decreases (by blocking direct lines of sight) from shipyard-related noise levels on this parcel, depending on phasing.	N/A
Parcel E4	RALI	50	66 dBA	66-69 dBA	Acceptable for RALI uses (≤70 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Parcel C1 Rooftop	Parks/Sport Courts	NA	58-66 dBA	58-71 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}) except Conditionally Acceptable only on C1 immediately adjacent to 21st Street (71-77.5 dBA, L_{dn}).	N/A
Parcel C2 Rooftop	Parks/Sport Courts	NA	58-66 dBA	58-70 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}).	N/A
Waterfront Promenade	Open Space/Parks	NA	58-66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, L_{dn}).	N/A
Waterfront Terrace	Open Space/Parks	NA	66 dBA	58-68 dBA	Acceptable for water-related recreational uses (≤75 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Slipway Commons	Open Space/Parks	NA	66 dBA	58-66 dBA	Acceptable for water-related recreational uses (≤75 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Building 12 Market Plaza/ Square	Open Space/Parks	NA	66 dBA	66-68 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}), but potential noise conflicts with adjacent residential uses.	N/A
Illinois Parcels[3]						
Parcel PKN	Residential	65	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}), and new residential construction generally discouraged on south façade (>70 dBA, L_{dn}), but acceptable interior levels can still be achieved with supplemental noise-reduction measures. Project residences on west side would be subject to noise generated by AIC with maximum exterior noise levels up to 77 dBA (L_{max}), averaging 70 dBA (L_{max}) during the nighttime hours.	Yes (#3)

Table 14: Noise Compatibility By Parcel - Maximum Commercial Scenario

Project Parcel/ Building	Max Com Scenario Proposed Use	Maximum Height (feet)	Existing Noise Level (L_{dn})	With Future Traffic Noise Increases (L_{dn})[1]	Noise Compatibility with Proposed Use (Comparison to City Noise Guidelines in Figure 7)	Noise Abatement Needed
Parcel PKS	Residential	65	62-64 dBA	65-72 dBA	Conditionally Acceptable for residential uses (>60 dBA, L_{dn}), and new construction generally discouraged on north façade (>70 dBA, L_{dn}), but acceptable interior levels can still be achieved with supplemental noise-reduction measures. Project residences on west side would be subject to noise generated by AIC with maximum exterior noise levels up to 77 dBA (L_{max}), averaging 70 dBA (L_{max}) during the nighttime hours.	Yes (#3)
Hoedown Yard (HDY1/2)	Com-Office	65	62-64 dBA[4]	62-70 dBA	Acceptable for commercial-office uses (≤70 dBA, L_{dn}). Project commercial uses on west side would be subject to noise generated by AIC (up to 77 dBA (L_{max}), averaging 70 dBA (L_{max}) during the nighttime hours) to the west and PG&E transformers to the south (increased ambient of 10 to 13 dBA (L_{eq}) at 200 feet during the night[5]), no noise compatibility problems since commercial uses are not considered noise-sensitive.	N/A
20th Street Plaza	Open Space/Parks	NA	62-64 dBA	62-71 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}) except Conditionally Acceptable adjacent to 20th Street (70-77.5 dBA, L_{dn}).	N/A
Irish Hill Playground	Open Space/ Parks	NA	62-64 dBA	62-72 dBA	Acceptable for playgrounds/parks (≤70 dBA, L_{dn}) but Conditionally Acceptable adjacent to 21st Street and Illinois Street (70-77.5 dBA, L_{dn})	N/A

Notes: N/A = Not applicable and no mitigation required because it is not a noise-sensitive use. As indicated in the Setting above, closed windows reduce noise levels by approximately 25 dBA, while open windows reduce noise levels by about 15 dBA.

[1] Traffic noise levels were first estimated for each Project roadway based on future estimated traffic volumes, and then adjusted for distance to the edge of the road rights-of-way to represent the maximum noise level at closest possible location of a building façade. Noise levels by façade are listed for each parcel and building on the project site in **Attachment 2: Project On-Site Noise Exposure by Parcel.** The above table summarizes these estimates by presenting the lowest and highest combined noise levels for each parcel at the edge of the adjacent or closest road rights-of-way.

[2] All 28-Acre Site parcels except existing Buildings 2, 12, and 21 would be permitted to include parking on the ground floor and below grade. Also RALI uses would be allowed on the ground floor of Parcels A, B, C1, C2, D, E1, E2, E3, F, G, H1, and H2.

[3] Retail/Restaurant uses would be allowed on the ground floor and accessory parking proposed on all four parcels.

[4] Ambient noise levels for Parcel HDY are estimated based on measurements collected along Illinois to the north because measurements at Parcel HDY included noise from heavy equipment operations associated with the existing PG&E corporation yard activities. These operations would cease on this parcel when this parcel is redeveloped as part of Project implementation, but transformer noise from the Potrero Substation would continue.

[5] When measured L90 levels between midnight and 4:00 a.m. are compared between LT-6 and LT-7 (same distance to Illinois except LT-7 is located 200 feet from the Potrero Substation to the south), the difference in nighttime ambient was 10 to 13 dBA, which could be attributable to the Potrero Substation.

Source: Orion Environmental Associates, 2016

Compatibility with Future Noise Levels

As indicated above, the primary sources of future noise on the project site and its vicinity are from BAE Systems Ship Repair facility activities, earthmoving activities in the southwestern corner of the Illinois Parcel (PG&E Hoedown Yard), Existing Plus Project traffic noise on Illinois Street and other local streets, tonal noise from transformers at the PG&E Potrero Substation, and loading dock activities along Illinois Street at the American Industrial Center (AIC). In addition to shipyard-related noise, there is continuous, distant background traffic noise from the I-280 freeway and other roadways. Passing Muni light rail and Caltrain rail operations also contribute to background noise. Long-term noise measurements collected in the project site and vicinity indicate that noise levels on the Illinois Parcels from these existing and future noise sources range from 64 to 68 dBA (L_{dn}), while noise levels in the southeastern portion of the 28-Acre Site range from 57 to 59 dBA (L_{dn}), which are somewhat quieter than those typical of light industrial/urban mixed-use locations. When measurement locations LT-3 and LT-4 are compared with measurement locations LT-1 and LT-2, existing intervening buildings (located both off- and on-site) appear to effectively shield some portions of the Mixed-Use District project site from noise generated by ship repair activities.

In general, the Maximum Residential Scenario would result in development of the greatest number of new residences, while the Maximum Commercial Scenario would result in development of the least number of residences. Both scenarios would result in development of the same amount of open space. Under both scenarios, multi-family residential units would be developed generally along the western and central portions of the project site (east side of Illinois Street, across from the AIC on Parcels PKN and PKS, and in the center of the site, Parcels D and E1, and in the central and eastern portions of the site (Parcels E2 and E3). Under both scenarios, Parcel C1 could be developed with residential, commercial, or parking uses and Parcel C2 could be developed with residential or parking uses. Active rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on both of these parcels under both scenarios as well, if the parcels are developed with parking uses. However, under the Maximum Residential Scenario, residential uses would be developed along the southern boundary instead of commercial uses (Parcels HDY 1/HDY2, F/G, H1/H2) as well as in the center of the Mixed-Use District project site (Building 2). Noise levels are lowest in the southeast portion of the Mixed-Use District project site and the residential units in the center of the site would be shielded from BAE operational noise by commercial-office buildings to the north. Under both scenarios, residential uses on the western boundary of the Mixed-Use District project site would be subject to the highest noise levels from traffic on Illinois Street as well as activities at the AIC building and from operation of Potrero Substation.

The degree to which noise causes disturbance to people depends on noise frequencies, bandwidths, levels and time patterns. In addition, higher frequencies, pure tones and fluctuating noise levels tend to be more disturbing than lower frequencies, broadband and constant-level noise. Although there are no standards or guidelines in the State Code or City noise guidelines that pertain to noise frequency or bandwidth, it is important to consider the noise character, which includes the following existing noise sources, when considering the suitability of the project site for residential uses and potential for future noise conflicts.

Based on the data presented in Table 6 (Summary of Long-Term (LT) and Short-Term (ST) Noise Monitoring in the Pier 70 Mixed-Use District project vicinity), the existing L_{dn} over most of the project site ranged from 60 to 69 dBA (L_{dn}) on the Illinois Parcels (LT-6 and LT-7), with slightly lower noise levels (57 to 59 dBA, L_{dn}) occurring in the southeastern corner of the 28-Acre Site (LT-5). A breakdown of noise compatibility by parcel and use for the Maximum Residential Scenario is presented in Table 13, Noise Compatibility By Parcel - Maximum Residential Scenario, while the same breakdown is provided for the Maximum Commercial Scenario in Table 14, Noise Compatibility By Parcel - Maximum Commercial Scenario.

Proposed Residential Uses. The San Francisco Land Use Compatibility Chart for Community Noise (Figure 7) indicate that noise levels up to 60 dBA (L_{dn}) are considered satisfactory (Acceptable) for residential uses and no special noise insulation measure are required; between 60 dBA and 70 dBA (L_{dn}), noise levels are considered Conditionally Acceptable, where a detailed noise analysis is required and needed noise insulation features must be included in the design; above 65 dBA (L_{dn}), new residential construction is generally discouraged, but if it does proceed, a detailed noise analysis is required and needed noise insulation features must be included in the design.

As indicated in Tables 13 and 14, future noise levels at all Project parcels designated for residential use have existing noise levels that are considered Conditionally Acceptable, ranging between 60 dBA and 70 dBA (L_{dn}), with one exception: Illinois Parcels PKN and PKS, where future noise levels are estimated to be slightly higher (72 dBA, L_{dn}) at 19 feet from the centerline of the future 21st Street. Except for the residential units that would face 21st Street on these two parcels, it is expected that proposed residential uses on the project site could be designed to meet the 45-dBA (L_{dn} or CNEL) interior noise standard specified by Title 24 with incorporation of common noise attenuation measures (see Noise Compatibility Approach 3, below). Examples of common noise attenuation measures include selecting glazing with higher noise reduction, improving exterior wall construction, and adapting the layout of interior spaces and/or location of windows. Any residential units subject to noise levels above 70 dBA (L_{dn}), such as those facing the future 21st Street on Parcels PKN and PKS, supplemental noise attenuation approaches may need to be implemented to meet the 45-dBA interior standard with open windows.

Historic Building 2 is proposed to be rehabilitated in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Noise levels measured just north of this building (LT-2) were 66 dBA (L_{dn}). When future traffic noise levels are added to existing ambient noise levels, future noise levels at the edges of road rights-of way are estimated to range between 66 and 70 dBA (L_{dn}). This building is proposed for residential uses under the Maximum Residential Scenario. When compared to the City's compatibility guidelines for residential uses (Figure 7: San Francisco Land Use Compatibility Chart for Community Noise), future noise levels in the vicinity of this building are considered to be Conditionally Acceptable and noise attenuation approaches would need to be incorporated as necessary into the project design in order to meet the 45-dBA interior noise standard.

The applicant will be required to demonstrate that the 45-dBA (L_{dn} or CNEL) interior noise standard specified by Title 24 would be met at all Project residences, and additional noise attenuation measures are required to be incorporated into the project design as necessary to meet this interior standard, but also

address potential sleep disturbance effects on affected parcels (as indicated in Tables 13 and 14) from adjacent or nearby industrial activities. It is noted that on-site noise levels could increase with proposed building demolition (as noted in Tables 13 and 14), but also decrease in the future with Project implementation if existing heavy equipment operations at the Hoedown Yard cease and Proposed Project buildings are up to 90 feet tall in the northern portion of the 28-Acre Site. Such building heights could help partially shield the rest of the site from noise generated by the BAE Systems Ship Repair facility (i.e., BAE boilers and generators). Such future noise reductions, however, would ultimately depend on the final locations and heights of proposed buildings but could reduce the extent of noise attenuation required at some residential units.

Proposed Open Space/Park/Playground Uses. In urban environments, playgrounds and parks (active recreation areas) as well as open space areas in urban areas are not considered noise-sensitive uses, and therefore, the following analysis of noise compatibility is provided for informational purposes only. Under the City's compatibility guidelines for playgrounds and parks (Figure 7: San Francisco Land Use Compatibility Chart for Community Noise), noise levels up to 70 dBA (L_{dn}) are considered to be Acceptable, and no noise attenuation approaches need to be implemented. As indicated in Tables 13 and 14, future noise levels at all but three Project parcels designated for open space/park/playground uses are estimated to range between 60 dBA and 70 dBA (L_{dn}). Such levels are considered Acceptable for these outdoor uses. Future noise levels under both scenarios could reach 71 or 72 dBA along the edges of the Parcel C1 Rooftop, 20th Street Plaza, and Irish Hill Playground (located adjacent to 20th and 21st Streets), and such levels are considered Conditionally Acceptable. While noise levels exceeding 70 dBA (L_{dn}) are attributable to traffic noise on these streets, they would only occur along the margins of the park/open space located adjacent to these streets, not the main park or playground areas. Park users could access quieter areas within these parks (away from adjacent streets), and noise levels would be considered generally acceptable at proposed open space/park/playground areas.

Proposed Special Events. The Proposed Project would include development of a number of public open spaces. The open space planning chapter in the *Pier 70 SUD Design for Development* provides concepts and approximate hypothetical site plans, but these concepts and site plans will be further developed. Under the conceptual ideas, the Market Square open space area is proposed to have open-air markets, market stalls, small performances, and gatherings (between Buildings 2, 12, and Parcel D). Community gatherings (i.e., festivals, performances, and nighttime cultural events) are proposed in the Slipways Common open space area (between Parcels E1, E2, E3, E4, and Building 21). A café terrace, social lawn, beer garden, food/beverage operations, and picnic area are proposed in the Waterfront Terrace open space area. Viewing pavilions proposed in the Waterfront Promenade would accommodate a variety of public program uses such as cultural events and gatherings. Typical events, occurring up to an estimated three times a month, could have attendance of approximately 500 to 750 people, while larger-scale events, occurring approximately four times per year, could have attendance up to 5,000 people. The Waterfront Promenade would also include pedestrian and bike trails, café terrace, and passive recreation. The Irish Hill Playground (between Parcels PKS, HDY, C1, and C2) would have playground facilities. If Parcels C1 and C2 are built as district parking, there would be public open space on the rooftops. While final

plans for this open space area have not been developed, potential uses for this open space include sport courts and play fields, urban agriculture plots, seating, and observational terrace areas.

Residential uses are proposed to be developed adjacent to the Irish Hill Playground (Parcel PKS under both scenarios and Parcel HDY under the Maximum Residential Scenario). Residential uses would also be developed adjacent to the Market Square open space area (Building 2 and Parcel D under the Maximum Residential Scenario, but only Parcel D under the Maximum Commercial Scenario). Residential uses would also be proposed adjacent to Slipway Commons, where events would be held during the day and evening (Parcels E1, E2, and E3 under both scenarios), as well as adjacent to the Waterfront Promenade, where cultural events would be held during the day and evening (Parcel H2 under Maximum Residential Scenario). RALI or commercial-office uses are proposed adjacent to the Waterfront Terrace open space area (Parcels B2 and E4 under both scenarios), where there would be more intensive outdoor uses (a beer garden and food/beverage operations).

The proximity of future residential uses to these types of open space uses would pose the potential for Proposed Project residents to be disturbed or annoyed by noise from outdoor active recreation/open space activities. Noise levels associated with the proposed café terrace, social lawn, beer garden, food/beverage operations, picnic areas and the playground would be typical of an urban, mixed-use residential area and considered to be compatibility with nearby sensitive receptors. The potential noise conflicts would be greatest where amplified sound systems would be used and/or events occur during the more noise-sensitive late evening/nighttime hours when sleep disturbance could occur.

As discussed above under Local Regulations and Guidelines, promoters of any proposed outdoor events on the site's outdoor plaza that would use amplified sound or music would be required to obtain a permit from the City prior to the event. Section 1060.1 of the Police Code requires a permit to conduct, operate, or maintain a place of entertainment, limited live performance locale or one-time event within the City and County of San Francisco. Concerts in the proposed open spaces would require the promoter to obtain a Limited Live Performance Permit from the San Francisco Entertainment Commission. This permit process requires a public hearing and includes a requirement for neighborhood outreach. Article 1, Section 47.2 of the Police Code, while generally focused on truck-mounted amplification equipment, regulates the use of any sound amplifying equipment, whether truck-mounted or otherwise. Hours of operation are restricted to between 9:00 a.m. and 10:00 p.m., unless permitted by the San Francisco Entertainment Commission.

Due to uncertainties as to the nature and extent of future outdoor events at the project site, the use of amplified sound equipment could still have the potential to adversely affect nearby sensitive receptors by exceeding standards established in the San Francisco General Plan or San Francisco Noise Ordinance. Implementation of Noise Compatibility Approach 5: Noise Control Plan for Outdoor Amplified Sound, shown below, would ensure that sound levels generated by amplified equipment would be consistent with Section 2909 of the City's Police Code, which establishes a not-to-exceed (except through a variance) noise standard for fixed sources of noise and from events subject to regulation by the Entertainment Commission. Event noise generated from a public property would be limited to 10 dBA above the local ambient at a distance of 25 feet or more; event noise generated from a commercial property would be

limited to 8 dBA above the local ambient at any point outside the property plane. In addition, compliance with Section 2909(d) would limit noise from outdoor activities in residential interiors to 45 dBA between 10:00 p.m. and 7:00 a.m. or 55 dBA between 7:00 a.m. and 10:00 p.m. with windows open. Any variance to these limits granted pursuant to Section 2910 of the Police Code could only be approved through the Entertainment Commission hearing process required by Section 1060.1 of the Police Code.

Cumulative Impacts

The geographic scope of potential cumulative noise impacts encompasses the project site and its immediate vicinity, as well as areas adjacent to access and construction haul routes to the project site.

Construction-Related Noise Increases

In general, the potential for cumulative noise increases associated with Project construction would result if there are any other projects located nearby that could be constructed at the same time or extend the duration of construction noise at any nearby sensitive receptors. The closest sensitive receptor is located approximately 140 feet northwest of the site (616 20th Street). The closest cumulative projects where concurrent construction could cumulatively increase noise levels in the vicinity of the project site would be the proposed BAE Lease Renewal project, located immediately north of the 28-Acre Site, located approximately 200 feet north of the Illinois Parcels, and Crane Cove Park, located north of the 20th Street Historic Core project and BAE Lease Renewal project. BAE improvements would involve mostly routine maintenance and repair work and not expected to generate noise levels higher than normal operations. These activities are expected to occur every 18 months for 6 weeks at a time over the next 7 years. Crane Cove Park would involve primarily park improvements. Phase 1 of Crane Cove Park would be completed in January 2018, which is approximately when construction of the Proposed Project would start, minimizing the potential for overlapping construction activities. Phase 2 of Crane Cove Park has not been determined, but could occur between August 2026 and December 2028, which could overlap with Phase 5 of the Proposed Project (2027 to 2029). However, Phase 5 construction would occur in the southern margin of the 28-Acre Site, which is the most distant portion of the site from Crane Cove Park, and such separation would minimize the potential for cumulative construction noise increases. Given the limited duration and scope of potential concurrent construction activities associated with these two cumulative projects (i.e., neither would involve the extended duration of construction and pile driving activities like those associated with Project construction), cumulative noise impacts associated with any overlapping construction would not be substantial.

Construction activities associated with the Project in combination with construction of these and other cumulative projects in the vicinity (such as Golden State Warriors Event Center and Mixed Use Development, Seawall Lot 337/Pier 48, and various smaller projects located in the neighborhoods to the west of the site) could result in cumulative increases in construction-related traffic on construction routes such as Illinois Street, 25th Street, or Cesar Chavez Street. These are the streets that provide access to/from the I-280 and SR 101 freeways. As these streets already serve as truck routes, they have higher ambient noise levels than local residential streets. Given that these truck routes have limited residential or other sensitive receptor land uses located adjacent to these routes, cumulative traffic increases on these

routes are not expected to substantially increase ambient noise levels in the vicinity of these routes for sensitive receptors.

Prior to Proposed Project implementation, Building 117 is expected to be demolished as part of the 20th Street Historic Core project. Demolition of this building could temporarily increase baseline noise levels on the project site from traffic on Illinois Street because it currently serves as a barrier and interrupts the line-of-sight between the project site and Illinois Street.[35] However, proposed construction of structures on Parcels C1 and C2 would restore this barrier effect for parcels and buildings to the east. In addition, retention of Buildings 2 and 12 would help to further block shipyard noise from parcels to the west and south (Parcels PKS, HDY, C1, C2, F, and G). Therefore, changes in the noise environment on the project site as a result of cumulative building demolition would not adversely affect future Project residents.

Operational Noise Increases

As indicated in **Table 15, Summary of Cumulative Traffic Noise Levels,** when Project-related traffic increases (under both the Maximum Residential and Maximum Commercial scenarios) are added to future traffic increases resulting from cumulative development, the Proposed Project would add 0 to 8.0 dBA (L_{dn}) to estimated cumulative noise increases under both scenarios. Of the 79 road segments examined, the Proposed Project would contribute considerably to cumulative traffic noise increases along the following street segments:

- 22nd Street (east of Third Street to east of Illinois Street)
- Illinois Street (Mariposa Street to 22nd Street)

These street segments either directly adjoin the project site or are within two blocks of the project site and provide direct access to the site. It is noted that existing land uses located adjacent to all of the above-listed street segments are commercial or industrial, and such uses are not considered sensitive to traffic noise increases (i.e., not noise-sensitive receptors). Residential development is located adjacent to the segment of Illinois Street between Mariposa Street and 20th Street. Based on the guidance thresholds for traffic noise increases, these cumulative traffic noise increases would be a substantial contribution to cumulative noise increases along these road segments.

Additionally, when 2040 cumulative (with Proposed Project) noise levels are compared to 2020 baseline noise levels, 2020 noise levels would increase by 0 to 15 dBA under both scenarios with increases exceeding guidance thresholds for traffic noise increases on the following roadway segments:

- Third Street (Channel to south of Mission Rock and 20th to 23rd Streets)
- 20th Street (east of Third Street to east of Illinois Street)
- 22nd Street (west of Third Street to east of Illinois Street)
- 23rd Street (Third Street to Illinois Street)

[35] Increased baseline would result in lower impacts; therefore, not accounting for this increased baseline is a conservative approach.

Table 15: Summary of Cumulative Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
Third Street	North of Harrison	67.1	67.3	67.7	0.6	0.4	67.8	0.7	0.4	Res/Com/Off
	Harrison to Bryant	67.8	68.3	68.6	0.8	0.3	68.7	0.9	0.3	Res/Com/Ind
	South of Bryant	67.5	67.9	68.3	0.8	0.4	68.4	0.9	0.5	Res/Com/Ind
	North of King	67.3	68.2	68.6	1.3	0.4	68.7	1.3	0.5	Res/Com
	King to Terry Francois	66.3	67.7	68.5	2.2	0.7	68.5	2.2	0.8	Ballpark/Res
	Terry Francois to Channel	65.6	67.4	68.2	2.6	0.8	68.3	2.7	0.9	Vacant/Parking
	Channel to Mission Rock	65.5	68.0	68.8	**3.3**	0.7	68.8	**3.4**	0.8	**Res**/Parking
	South of Mission Rock	65.3	67.7	68.5	**3.2**	0.8	68.6	**3.3**	0.9	UCSF/Inst/**Res**
	North of 16th	66.2	67.9	68.8	2.5	0.9	68.8	2.6	0.9	UCSF/Inst
	16th to Mariposa	66.4	67.5	68.7	2.3	1.2	68.7	2.3	1.2	Hospital/Ind
	Mariposa-20th	65.5	67.4	68.4	2.8	1.0	68.3	2.8	0.9	Res/Com/Ind
	20th to 22nd	66.0	68.4	69.2	**3.1**	0.8	69.3	**3.2**	0.9	**Res**/Com/Ind
	22nd to 23rd	66.4	68.2	69.9	**3.5**	1.7	69.8	**3.4**	1.6	Com/**Res**
	23rd to 25th	66.2	67.4	69.2	3.0	1.9	69.2	3.0	1.8	Ind
	25th to Cesar Chavez	66.3	67.7	69.1	2.8	1.4	69.0	2.8	1.3	Com/Ind

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		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
	South of Cesar Chavez	65.6	67.1	67.5	1.9	0.3	67.5	1.9	0.3	Ind
16th Street	West of Mississippi	64.5	65.9	66.5	2.0	0.6	66.5	2.0	0.6	Com/Ind
	East of Mississippi	65.7	66.8	67.5	1.8	0.7	67.5	1.8	0.7	Com/Ind
	West of Owens	65.7	66.9	67.6	1.9	0.7	67.5	1.9	0.6	UCSF/Inst.
	East of Owens	65.9	66.3	67.2	1.3	0.9	67.1	1.2	0.8	UCSF/Inst.
	West of Third	65.4	66.6	67.8	2.4	1.2	67.7	2.3	1.1	UCSF/Hospital
	East of Third	60.0	63.1	64.3	4.4	1.3	64.3	4.4	1.3	UCSF/Inst.
18th Street	West of Arkansas	54.7	54.9	55.8	1.1	0.9	55.8	1.1	0.9	Res/Ind
	East of Arkansas	55.4	56.6	57.2	1.9	0.6	57.2	1.9	0.6	Res/Com
	West of Texas	58.3	59.1	59.5	1.1	0.4	59.5	1.1	0.4	Res/Com
	Texas to Pennsylvania	58.5	59.1	59.4	0.9	0.3	59.4	0.9	0.3	Res/Com
	East of Pennsylvania	59.0	59.9	61.0	2.0	1.1	60.8	1.8	0.9	Off/Com
	West of Indiana	59.0	59.9	61.0	2.0	1.1	60.8	1.8	0.9	Ind
	East of Indiana	59.2	60.7	62.3	3.1	1.5	62.2	3.0	1.5	Ind
20th Street	West of Third	58.9	59.8	60.7	1.8	0.9	60.7	1.8	0.9	Res/School/Ind
	East of Third	59.7	61.8	65.9	**6.2**	4.1	65.9	**6.2**	4.1	Ind

Table 15: Summary of Cumulative Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
	West of Illinois	59.6	62.8	66.2	**6.7**	3.4	66.3	**6.7**	3.4	Ind
	East of Illinois	62.4	64.5	67.9	**5.5**	3.4	67.9	**5.5**	3.4	Ind
22nd Street	West of Indiana	59.4	61.8	63.5	4.1	1.8	63.5	4.1	1.8	Ind
	Indiana to Tennessee	58.8	61.1	63.1	4.4	2.0	63.1	4.4	2.0	Res
	Tennessee to Third	58.4	59.8	62.3	**4.0**	2.5	62.3	**4.0**	2.5	Com/**Res**
	East of Third	58.5	59.6	67.1	**8.6**	**7.5**	66.9	**8.4**	**7.3**	Ind
	West of Illinois	58.1	59.0	67.0	**8.9**	**8.0**	66.8	**8.7**	**7.8**	Ind
	East of Illinois	51.1	59.5	66.3	**15.2**	**6.7**	66.3	**15.2**	**6.7**	Ind
23rd Street	West of Third	56.5	58.4	60.9	4.4	2.6	60.9	4.4	2.5	Ind
	East of Third	54.9	58.3	60.5	**5.5**	2.1	60.5	**5.5**	2.2	Ind
	West of Illinois	53.6	58.4	60.5	**6.9**	2.1	60.5	**6.9**	2.1	Ind
	East of Illinois	50.9	53.2	53.2	2.3	0.0	53.2	2.3	0.0	Ind
25th Street	West of Pennsylvania	56.5	59.5	59.5	3.0	0.0	59.5	3.0	0.0	Res
	East of Pennsylvania	59.4	60.7	62.5	3.1	1.8	62.6	3.1	1.9	Ind
	West of Indiana	59.3	60.7	62.5	3.2	1.8	62.6	3.2	1.9	Ind
	East of Indiana	59.4	60.7	62.5	3.1	1.8	62.6	3.1	1.9	Ind
	West of Third	57.4	59.6	62.7	**5.3**	3.1	62.9	**5.5**	3.3	Ind

Table 15: Summary of Cumulative Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
	East of Third	53.0	57.7	60.0	**7.0**	2.3	60.3	**7.3**	2.6	Ind
	West of Illinois	54.0	57.7	60.0	**6.0**	2.3	60.3	**6.3**	2.6	Ind
	East of Illinois	49.5	53.7	53.7	4.1	0.0	53.7	4.1	0.0	Ind
Cesar Chavez	West of Pennsylvania	65.1	65.5	66.7	1.6	1.2	66.7	1.6	1.2	Ind
	East of Pennsylvania	64.6	65.2	67.6	3.0	2.4	67.6	3.0	2.3	Ind
	West of Third	63.4	64.4	67.1	3.7	2.7	67.1	3.7	2.7	Ind
	East of Third	58.2	60.4	63.5	**5.2**	3.1	63.5	**5.2**	3.1	Ind
Arkansas Street	North of 18th	54.9	56.1	56.1	1.2	0.0	56.1	1.2	0.0	Res/Ind
	South of 18th	54.2	55.5	55.5	1.3	0.0	55.5	1.3	0.0	Res
Future Driveway	East of Illinois	NA	NA	65.2	NA	NA	65.2	NA	NA	Ind
Illinois Street	North of Mariposa	56.8	60.4	62.0	**5.3**	1.6	62.1	**5.3**	1.6	Vacant/UCSF
	Mariposa-19th	59.9	60.4	63.7	**3.8**	**3.3**	63.7	**3.8**	**3.3**	**Res**/Com/Ind
	19th to 20th	60.4	60.6	64.6	**4.1**	**4.0**	64.5	**4.1**	**4.0**	**Res**/Com/Ind
	20th to Driveway	58.9	59.5	64.8	**5.9**	**5.3**	64.6	**5.7**	**5.1**	Ind
	Driveway to 22nd	58.9	60.9	66.4	**7.5**	**5.5**	66.3	**7.4**	**5.3**	Ind
	South of 22nd	57.6	59.6	63.9	**6.3**	4.3	64.0	**6.5**	4.4	Ind
Indiana Street	North of 22nd	54.1	55.3	55.3	1.1	0.0	55.3	1.1	0.0	Com/Ind
	South of 22nd	54.6	55.2	55.2	0.6	0.0	55.2	0.6	0.0	Ind
	North of 25th	58.6	61.5	62.5	**3.8**	0.9	62.6	**4.0**	1.1	Ind/**Res**
	South of 25th	57.5	60.0	60.0	2.6	0.0	60.0	2.6	0.0	Ind/Res

Table 15: Summary of Cumulative Traffic Noise Levels

Street	Segment or Cross-Street	Ldn/CNEL Noise Level (dBA) at 50 Feet from Roadway Centerline								Existing Use
		Baseline (2020)	Cumulative Baseline (2040)	With Cumulative + Max Res	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	With Cumulative + Max Com	Change from Baseline (Max Res)	Change from Cumulative (Max Res)	
Mariposa Street	West of I-280 Ramp	63.8	64.3	64.3	0.5	0.1	64.3	0.5	0.1	Ind/Res
	East of I-280 Ramp	65.6	67.2	67.5	1.9	0.2	67.5	2.0	0.3	Ind
	East of Indiana	63.4	65.5	66.0	2.6	0.4	66.0	2.6	0.4	Ind
	West of Third	62.5	64.8	65.3	2.8	0.5	65.3	2.8	0.5	Ind/Res
	East of Third	60.3	63.1	63.8	3.5	0.7	63.8	3.4	0.7	Ind
	West of Illinois	60.2	63.1	63.8	3.6	0.7	63.8	3.6	0.7	Ind
	East of Illinois	59.6	61.5	61.5	1.9	0.0	61.5	1.9	0.0	Ind
Tennessee Street	North of 22nd	53.4	56.0	56.0	2.7	0.0	56.0	2.7	0.0	Com/Res
	South of 22nd	49.7	49.9	49.9	0.2	0.0	49.9	0.2	0.0	Res/Com
Texas Street	North of 18th	52.6	53.1	53.1	0.5	0.0	53.1	0.5	0.0	Res
	South of 18th	51.5	52.9	52.9	1.4	0.0	52.9	1.4	0.0	Res

Notes: Noise levels may vary by up to one-tenth of a decibel due to rounding. Noise levels in **bold** exceed either of the following threshold increases when compared to baseline noise levels: (1) an increase of 5 dBA or more, or (2) an increase of 3 dBA or more in areas where the existing or resulting noise increase exceeds acceptable (or satisfactory) levels for the affected use (see Figure 7: San Francisco Land Use Compatibility Chart for Community Noise).

Res: Residential; Com: Commercial; Off: Office; Ind: Industrial; Inst: Institutional; UCSF: University of California, San Francisco Traffic noise modeling was completed using the Federal Highway Administration RD-77-108 model. Assumptions include: Travel speeds on all streets, 25 mph, except on 16th, Third, and Cesar Chavez, where the posted speed limit is 30 mph; Vehicle Mix: 98% Autos/1.5% Medium Trucks/0.5% Heavy Trucks; Day-Night Split: 76% Day (7:00 a.m. to 7:00 p.m.), 12% Evening (7:00 p.m. to 10:00 p.m.), and 12% Night (10:00 p.m. to 7:00 a.m.). Background noise levels due to traffic on other roadways (such as cross-streets or nearby freeways) and non-traffic-related activities are not reflected in these noise levels. Noise levels in this table are intended to indicate incremental noise changes due to Proposed Project implementation and future growth. Since they do not include background noise levels, they may not necessarily reflect actual noise levels along these roadway segments if there are other nearby sources of noise. Changes between scenarios analyzed may not show change due to rounding in the noise modeling.

Source: Orion Environmental Associates, 2016

- 25th Street (west of Third Street to Illinois Street)
- Cesar Chavez (East of Third Street)
- Illinois Street (Mariposa Street to south of 22nd Street)
- Indiana Street (north of 25th Street)

These street segments either directly adjoin the project site or are within approximately eight blocks of the project site and several provide direct access to the site. It is noted that existing land uses located adjacent to many of the above-listed street segments are commercial or industrial, and such uses are not considered sensitive to traffic noise increases (i.e., not noise-sensitive receptors). There is a school and residential development located adjacent to 20th Street between Third Street and Illinois Street. Residential development is also located adjacent to Third Street (Channel to 25th), Illinois Street (Mariposa Street to 20th Street), and on 22nd Street (west of Third Street). Based on guidance thresholds for traffic noise increases, these cumulative traffic noise increases would also be a substantial contribution to cumulative noise increases because traffic noise would result in a substantial permanent increase in baseline noise levels. The project's contribution to these increases would range from 22 to 95 percent of these increases and therefore, the Proposed Project contribution to these cumulative traffic noise increases would be cumulatively considerable.

Implementation of TDM measures (Noise Compatibility Approach 4, below) could result in reductions of one-way traffic by up to 20 percent, and such reductions could provide noise level reductions of up to 1.0 dBA. Such reductions would reduce the above noise increases to below the guidance thresholds along Illinois Street (between Mariposa Street and the proposed 23rd Street) and 22nd Street (west of Third Street) but would not be sufficient to reduce cumulative noise increases on any of the other above-listed street segments to below threshold levels. Cumulative traffic noise increases would still exceed threshold levels by up to 2.0 dBA when compared to future baseline noise levels (2040) and by up to 14.2 dBA when compared to existing baseline noise levels (2020).

Feasible Noise and Vibration Minimization Approaches

This section is divided into three sections. The first section outlines regulations that pertain to the Proposed Project and provide the basis for the performance standards that are specified in noise minimization approaches outlined in the second and third sections. The second section outlines noise minimization approaches for reducing the Project's construction-related noise. The third section identifies various approaches to be applied to the project design and future operations to reduce potential noise conflicts and increase future noise compatibility of proposed uses.

Regulatory Basis for Performance Standards

Noise ordinances regulate noise sources under the control of local jurisdictions, such as mechanical equipment and amplified sounds, as well as prescribe hours of heavy equipment operation. Time and noise limits prescribed in Article 29 of the Police Code are used in this analysis as a guideline to

determine where Project-related noise increases would be substantial and could adversely affect nearby sensitive receptors.[36] Relevant sections of the San Francisco Noise Ordinance that are used in this analysis to evaluate the effects of construction noise are as follows:

- Sections 2907 and 2908 of the San Francisco Noise Ordinance allows construction activities between 7:00 a.m. and 8:00 p.m. but limits noise from any individual piece of construction equipment, except impact tools approved by the San Francisco Public Works, to 80 dBA at 100 feet, which is equivalent to 86 dBA at 50 feet.

The following ordinance noise limits and General Plan policy provide the framework for establishing appropriate performance standards to the future design of Project residential buildings, which would help minimize the potential for future noise compatibility problems:

- Section 2909 of the San Francisco Police Code generally prohibits fixed mechanical equipment noise and music in excess of 5 dBA more than ambient noise from residential sources, 8 dBA more than ambient noise from commercial sources, and 10 dBA more than ambient on public property at a distance of 25 feet.

- Section 2909(c) of the San Francisco Police Code generally prohibits noise produced by any machine or device in excess of 10 dBA more than ambient on public property at a distance of 25 feet.

- Section 2909(d) of the Police Code establishes that no fixed noise sources (e.g., mechanical equipment) may cause the noise level inside any sleeping or living room in any dwelling unit located on residential property to exceed 55 dBA (7:00 a.m. to 10:00 p.m.) and 45 dBA (10:00 p.m. to 7:00 a.m.) in order to prevent sleep disturbance, protect public health and prevent the acoustical environment from progressive deterioration. This noise limit is applied to stationary sources that would be located near residential uses (as a second step or more detailed review, where initial screening review of noise limits in the above Section 2909 were exceeded).

- Title 24 of the California Building Code specifies a maximum interior noise limit of 45 dBA (L_{dn} or CNEL) for residential uses.

- City noise compatibility guidelines (Figure 7, San Francisco Land Use Compatibility Chart for Community Noise) indicate the maximum noise levels considered Acceptable are 60 dBA (L_{dn}) for residential uses. However, where noise levels exceed 70 dBA (L_{dn}), new residential development is generally discouraged. If new construction does proceed, a detailed analysis of noise reduction requirements must be made, and needed noise insulation features must be incorporated into the design. Tables 11 and 12 (Noise Compatibility By Parcel - Maximum Residential Scenario and Noise Compatibility By Parcel - Maximum Commercial Scenario,

[36] Noise limits specified in Sections 2907, 2908, and 2909 of the Police Code apply to a "person" generating noise, and Section 2901(h) of the Police Code excludes the City and County of San Francisco. Therefore, the City is exempt from these ordinance limits.

above) identify noise compatibility of proposed uses by parcel or building and recommended noise minimization approaches for each parcel.

Noise Minimization Approaches for Project Construction

The following construction-related noise minimization approaches provide feasible practices that could be applied to meet ordinance limits during Project construction:

Construction Noise Approach 1: Construction Noise Control Plan. Over the Project's approximately 11-year construction duration, Project contractors for all construction projects on the Illinois Parcels and 28-Acre Site will be subject to construction-related time-of-day and noise limits specified in Section 2907(a) of the Police Code, as outlined above. Therefore, prior to construction, a Construction Noise Control Plan shall be prepared by the project sponsors and submitted to the Department of Building Inspection. The construction noise control plan shall demonstrate compliance with these limits. Noise reduction strategies that could be incorporated into this plan to ensure compliance with ordinance limits may include, but are not be limited to, the following:

- Require the general contractor to ensure that equipment and trucks used for Project construction utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds).

- Require the general contractor to locate stationary noise sources (such as compressors) as far from adjacent or nearby sensitive receptors as possible, to muffle such noise sources, and to construct barriers around such sources and/or the construction site, which could reduce construction noise by as much as 5 dBA. To further reduce noise, the contractor shall locate stationary equipment in pit areas or excavated areas, to the maximum extent practicable.

- Require the general contractor to use impact tools (e.g., jack hammers, pavement breakers, and rock drills) that are hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used, along with external noise jackets on the tools, which would reduce noise levels by as much as 10 dBA.

- Include noise control requirements for construction equipment and tools, including concrete saws, in specifications provided to construction contractors to the maximum extent practicable. Such requirements could include, but are not limited to, erecting temporary plywood noise barriers around a construction site, particularly where a site adjoins noise-sensitive uses; utilizing noise control blankets on a building structure as the building is erected to reduce noise levels emanating from the construction site; performing all work in a manner that minimizes noise; using equipment with effective mufflers; undertaking the most noisy activities during times of least

disturbance to surrounding residents and occupants; and selecting haul routes that avoid residential buildings uses.[37]

- Prior to the issuance of each building permit, along with the submission of construction documents, submit to the Planning Department and Department of Building Inspection (DBI) or the Port, as appropriate, a plan to track and respond to complaints pertaining to construction noise. The plan should include the following measures: (1) a procedure and phone numbers for notifying DBI or the Port, the Department of Public Health, and the Police Department (during regular construction hours and off-hours); (2) a sign posted on-site describing permitted construction days and hours, noise complaint procedures, and a complaint hotline number that shall be answered at all times during construction; (3) designation of an on-site construction complaint and enforcement manager for the Project; and (4) notification of neighboring residents and non-residential building managers within 300 feet of the Project construction area at least 30 days in advance of extreme noise generating activities (such as pile driving) about the estimated duration of the activity.

Construction Noise Approach 2: Noise Control Measures During Pile Driving. The Construction Noise Control Plan (recommended in Construction Approach 1 above) shall also outline a set of site-specific noise and vibration attenuation measures for each construction phase when pile driving is proposed to occur. These attenuation measures shall be included wherever impact equipment is proposed to be used on the Illinois Parcels and 28-Acre Site. As many of the following control strategies shall be included in the Noise Control Plan, as feasible:

- Implement "quiet" pile-driving technology such as pre-drilling piles where feasible to reduce construction-related noise and vibration.

- Use pile-driving equipment with state-of-the-art noise shielding and muffling devices.

- Use pre-drilled or sonic or vibratory drivers, rather than impact drivers, wherever feasible (including slipways) and where vibration-induced liquefaction would not occur.

  Schedule pile-driving activity for times of the day that minimizes disturbance to residents as well as commercial uses located on-site and nearby.

- Erect temporary plywood or similar solid noise barriers along the boundaries of each Project parcel as necessary to shield affected sensitive receptors.

- Other equivalent technologies that emerge over time.

[37] Based on FHA documentation, the following reductions can be achieved: 3 dBA reduction for a noise barrier or other obstruction (like a dirt mound) that interrupts the line-of-sight between the noise source and the receptor; 8 dBA reduction if the noise source is completely enclosed or completely shielded with a solid barrier located close to the source; 5 dBA reduction if the enclosure and/or barrier have some gaps in it; 10 dBA reduction if the noise source is completely enclosed and completely shielded with a solid barrier located close to the source; 15 dBA reduction if a building stands between the noise source and receptor and completely shields the noise source; and 5 dBA reduction if noise source is enclosed or shielded with heavy vinyl noise curtain material (e.g., SoundSeal BBC-13-2 or equivalent).

Construction Noise Approach 3: Vibration Control Measures During Construction. As part of the Construction Noise Control Plan recommended above, appropriate vibration controls (including pre-drilling pile holes and using smaller vibratory equipment) shall be specified to ensure that the vibration limit of 0.5 in/sec PPV can be met at adjacent or nearby existing structures and Project buildings located on the Illinois Parcels or 28-Acre Site, except as noted below:

- Where pile driving and other construction activities involving the use of heavy equipment would occur in proximity to any contributing building to the Union Iron Works Historic District, the project sponsor shall undertake a monitoring program to minimize damage to adjacent historic buildings and to ensure that any such damage is documented and repaired. The monitoring program, which shall apply within 100 feet where pile driving would be used and within 25 feet of other heavy equipment operation, shall include the following components:

  - Prior to the start of any ground disturbing activity, engage a historic architect or qualified historic preservation professional to undertake a pre-construction survey of historical resource(s) identified by the San Francisco Planning Department within 125 feet of planned construction to document and photograph the buildings' existing conditions.

  - Based on the construction and condition of the resource(s), a structural engineer or other qualified entity shall establish a maximum vibration level that shall not be exceeded at each building, based on existing conditions, character-defining features, soils conditions, and anticipated construction practices in use at the time (a common standard is 0.2 inch per second, peak particle velocity).

  - To ensure that vibration levels do not exceed the established standard, a qualified acoustical/vibration consultant shall monitor vibration levels at each structure within 125 feet of planned construction and shall prohibit vibratory construction activities that generate vibration levels in excess of the standard. Should vibration levels be observed in excess of the standard, construction shall be halted and alternative construction techniques put in practice. (For example, pre-drilled piles could be substituted for driven piles, if soil conditions allow; smaller, lighter equipment could possibly also be used in some cases.) The consultant shall conduct regular periodic inspections of each building within 125 feet of planned construction during ground-disturbing activity on the project site. Should damage to a building occur as a result of ground-disturbing activity on the site, the building(s) shall be remediated to its pre-construction condition at the conclusion of ground-disturbing activity on the site.

- In areas with a "very high" or "high" susceptibility for vibration-induced liquefaction or differential settlement risks, the Project's geotechnical engineer shall specify an appropriate vibration limit based on proposed construction activities and proximity to liquefaction susceptibility zones and modify construction practices to ensure that construction-related vibration does not cause liquefaction hazards at these homes.

Noise Minimization Approaches for Project Design and Operation

The following noise minimization approaches incorporate the above performance standards and present feasible practices that could be applied to the project design and future operations to meet these standards during Project operation:

Noise Compatibility Approach 1: Stationary Equipment Noise Controls. Noise attenuation measures shall be incorporated into all stationary equipment (including HVAC equipment and emergency generators) installed on buildings constructed on the Illinois Parcels and 28-Acre Site as well as into the below-grade or enclosed wastewater pump station as necessary to meet noise limits specified in Section 2909 of the Police Code.[38] Interior noise limits shall be met under both existing and future noise conditions, accounting for foreseeable changes in noise conditions in the future (i.e., changes in on-site building configurations). Noise attenuation measures could include provision of sound enclosures/barriers, addition of roof parapets to block noise, increasing setback distances from sensitive receptors, provision of louvered vent openings, locating vent openings away from adjacent commercial uses, and restriction of generator testing to the daytime hours.

Noise Compatibility Approach 2: Design of Future Noise-Generating Uses. Future commercial/office and RALI uses shall be designed to minimize the potential for sleep disturbance at any future adjacent residential uses. Design approaches such as the following could be incorporated into future development plans to minimize the potential for noise conflicts of future uses on the project site:

- Design of Future Noise-Generating Commercial/Office and RALI Uses. To reduce potential conflicts between existing sensitive receptors and new noise-generating commercial or RALI uses located adjacent to these receptors, exterior facilities such as loading areas/docks, trash enclosures, surface parking lots should be located on the sides of buildings facing away from existing or planned sensitive receptors (residences or passive open space). If this is not feasible, these types of facilities should be enclosed or equipped with appropriate noise shielding.

- Design of Future Aboveground Parking Garage. If parking structures are constructed on Parcels C1 or C2, the sides of the parking structures facing adjacent or nearby existing or planned residential uses should be designed to shield residential receptors from noise associated with parking cars.

Noise Compatibility Approach 3: Design of Future Noise-Sensitive Uses. Prior to issuance of a building permit for vertical construction of a specific residential building design on each parcel, a noise study shall be conducted by a qualified acoustician, who shall determine the need to incorporate noise attenuation measures into the project design in order to meet Title 24's interior noise limit for residential

[38] Under Section 2909 of the Police Code, stationary sources are not permitted to result in noise levels that exceed the existing ambient (L90) noise level by more than 5 dBA on residential property, 8 dBA on commercial and industrial property, and 10 dBA on public property. Section 2909(d) states that no fixed noise source may cause the noise level measured inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dBA between 10:00 p.m. and 7:00 a.m. or 55 dBA between 7:00 a.m. and 10:00 p.m. with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

uses as well as the City's (Article 29, Section 2909(d)) 45-dBA (L_{dn}) interior noise limit for residential uses. This evaluation shall account for noise shielding by buildings existing at the time of the proposal, potential increases in ambient noise levels resulting from the removal of buildings that are planned to be demolished, all planned commercial or open space uses in adjacent areas, any known variations in Project buildout that have or will occur (building heights, location, and phasing), any changes in activities adjacent to or near the Illinois Parcels or 28-Acre Site (given the Project's long buildout period), any new shielding benefits provided by surrounding buildings that exist at the time of development, future cumulative traffic noise increases on adjacent roadways, existing and planned stationary sources (i.e., emergency generators, HVAC, etc.), and future noise increases from all known cumulative projects located with direct line-of-sight to the Project building.

To minimize the potential for sleep disturbance effects from tonal noise or nighttime noise events associated with nearby industrial uses, predicted noise levels at each Project building should account for 24/7 operation of the BAE Systems Ship Repair facility, 24/7 transformer noise at Potrero Substation (if it remains an open air facility), and industrial activities at the AIC, to the extent such use(s) are in operation at the time the analysis is conducted.

Noise reduction strategies such as the following could be incorporated into the project design as necessary to meet Title 24 interior limit and minimize the potential for sleep disturbance from adjacent industrial uses:

- Orient bedrooms away from major noise sources (i.e., major streets, open space/recreation areas where special events would occur, and existing adjacent industrial uses, including AIC, Potrero Substation, and the BAE site) and/or provide additional enhanced noise insulation features (higher STC ratings) or mechanical ventilation to minimize the effects of maximum instantaneous noise levels generated by these uses even though there is no code requirement to reduce L_{max} noise levels. Such measures could be implemented on Parcels D and E1 (both scenarios), Building 2 (Maximum Residential Scenario only), Parcels PKN (both scenarios), PKS (both scenarios), and HDY (Maximum Residential Scenario only);

- Utilize enhanced exterior wall and roof-ceiling assemblies (with higher STC ratings), including increased insulation;

- Utilize windows with higher STC/ Outdoor/Indoor Transmission Class (OITC) ratings;

- Employ architectural sound barriers as part of courtyards or building open space to maximize building shielding effects, and locate living spaces/bedrooms toward courtyards wherever possible; and

- Locate interior hallways (accessing residential units) adjacent to noisy streets or existing/planned industrial or commercial development.

Noise Compatibility Approach 4: Transportation Demand Management. The project sponsors shall prepare and implement a Transportation Demand Management (TDM) Plan with a goal of reducing estimated one-way vehicle trips by 20 percent compared to the one-way vehicle trips calculated for each building using the trip generation rates contained within the project's Transportation Impact Study. The

project sponsors shall create a Transportation Management Association that would be responsible for the administration, monitoring, and adjustment of the TDM Plan. Recommended components of the TDM Plan are outlined in the Pier 70 Air Quality Technical Report and Chapter 11, Section G, Air Quality, Mitigation Measure M-AQ-1f of the Draft EIR.

Noise Compatibility Approach 5: Noise Control Plan for Special Outdoor Amplified Sound. The project sponsor shall develop and implement a Noise Control Plan for operations at the proposed entertainment venues to reduce the potential for noise impacts from public address and/or amplified music. This Noise Control Plan shall contain the following elements:

- The project sponsor shall comply with noise controls and restrictions in applicable entertainment permit requirements for outdoor concerts.
- Speaker systems shall be directed away from the nearest sensitive receptors to the degree feasible.
- Outdoor speaker systems shall be operated consistent with the restrictions of Section 2909 of the San Francisco Police Code, and conform to a performance standard of 8 dBA and dBC over existing ambient L_{90} noise levels at the nearest residential use.

Attachment 1

VIBRO-ACOUSTIC CONSULTANTS REPORT

AND

SUPPLEMENTAL NOISE MEASUREMENT DATA

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Pier 70 Site Feasibility Study

Pier 70, San Francisco, CA

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Date: 22 June 2012

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1. Background

Pier 70 is a 69-acre multi-use site with an active shipyard with dry dock capabilities (approximately 10-acres), historic repair facilities and commercial properties. As we understand it, Forest City is proposing several multi-use developments at Pier 70, including a multi-family residential component on the southeastern 25-acre parcel of the site. Review of the Port's current master plan and the nearby areas reveals that there are already residential uses in proximity to the shipyard. Forest City has requested a feasibility study to determine if a multi-family residential land use is compatible with the existing noise environment at Pier 70. We conducted long-term acoustical measurements at Pier 70 from May 11 to May 16, 2012, to characterize the existing noise environment.

2. General Methodology

We visited the site to conduct 96-hour measurements at four locations within the Pier 70 area. Short-term noise measurements were also conducted at the active ship repair facilities to assist with identifying the noise character of ship repair work. Data were collected in both overall A-weighted noise levels as well as in 1/3-octave band spectra, which allows for characterization of the different noise sources as well as to assist with the feasibility determination.

3. Data Collection

3.1 Measurement System Parameters

We measured the exterior noise levels using our standard testing suite:

Instrument	Make / Model	Identification
Noise Meter	Norsonic N-140	S/N 1403260
Microphone Preamplifier	Norsonic N-1209	S/N 13223
Microphone	Norsonic N-1225	S/N 96063
Noise Meter	Norsonic N-140	S/N 1403581
Microphone Preamplifier	Norsonic N-1209	S/N 12749
Microphone	Norsonic N-1225	S/N 103130
Noise Meter	Larson-Davis LxT1	S/N 0002773
Noise Meter	Larson-Davis LxT1	S/N 0002846
Microphone Calibrator	Bruel & Kjaer 4231	S/N 2671559

The noise monitors were calibrated to 94 dB at 1 kHz prior to and checked after the measurements. The monitors were set to collect overall A-weighted data as well as 1/3-octave band spectra in 1-minute periods.

3.2 Measurement Locations

We collected noise data at 9 locations:

- LT-1: To the south of Pier 64 at Slips 5 and 6, approximately 100-feet to the east of a potential multi-family residential building.
- LT-2: The northern façade of Building 2, at the roof level.
- LT-3: To the southeast of Building 6, near the northern boundary of Sims Metal Management, and just north of another potential residential building.
- LT-4: Along Illinois Street, just north of Building 103. This location was selected for its proximity to an approved multi-family residential development.
- ST-1: At Dry Dock 2 while the Golden Princess was being repaired.
- ST-2: To the west of Dry Dock 2, at the Aggreko generators.
- ST-3: At Dock 4 East while a US military ship was being repaired
- ST-4: At the western end of the repair facilities.
- ST-5: At the southern façade of a boiler building serving BAE.

In all cases, the microphone was placed 5 to 7-feet above the sidewalk/ground and several feet away from other boundaries. A schematic diagram of the site is given in Figure 0, with approximate measurement locations indicated.

3.3 Site Conditions

Long-term measurements were conducted from May 11 to May 16 2012; short-term measurements at the ship repair yards were conducted on May 17 2012. The general weather during this period was mild (50 to 75F) with moderately gusty wind conditions (5 to 10mph with some 15mph gusts). The wind was strong enough to contaminate the low frequency data; however, this had no effect on the overall results. No rain was reported during the measurements. Traffic on adjacent roadways appeared to be typical.

The long-term measurement window of May 11 to 16 was selected because multiple ships would be in dry dock for repairs, a theoretically worst-case condition. Work logs provided by BAE (the operator of the shipyard) indicate that most of the work involved the use of cranes, forklifts, and power tools to perform water blasting and painting.

At LT-1, the ship repair activities were clearly audible above the ambient background noise levels during our time on site. We did observe several large trucks and buses using the parking lot in the vicinity of the noise instrument and suspect that local vehicle activity significantly contributes to the ambient environment.

At LT-2, the ambient noise was dominated by traffic in the distance as well as local industrial activity. The ship repair activities were clearly audible during our time on site. It was discovered after our measurements that some lighting ballasts at the roof were very noisy. Post-processing of the data revealed this to be a non-issue with reporting accurate overall noise results.

At LT-3, next to Sims Metal Management, the noise was dominated by local shop activity on May 11 to 12 and 14 to 16; however, the shop was closed on Sunday (May 13), so the noise levels during that day are more representative of ship repair activities. Ship repair activities were audible during our time on site. Currently, historic Building 6 is rather porous (many of the windows are broken out), but this structure still serves as an effective noise barrier between the measurement location and the ship repair activities. We understand that the windows would be repaired as part of any residential development, further increasing the shielding provided by this building.

At LT-4, in the tow yard adjacent to Illinois Street, the ambient noise levels were dominated by local traffic and activities associated with the construction of a multi-family project on Illinois Street, between 19th and 20th Streets. We understand that construction did occur on Saturday (May 12) but not Sunday (May 13). Ship repair activities were not audible at this location during our time on site.

3.4 Data Presentation

The noise data are presented as an overall level time history over a 96-hour period given in units of sound pressure level re: 20μPa. The equivalent sound pressure (L_{EQ}) and L_n statistical level time histories are presented in Figures 1 through 4 (the 12-hour block of missing data on Figure 2 was due to a battery that failed sooner than expected). The L_n is a statistical descriptor, denoting the sound pressure level exceeded n% of the measurement duration. It is a useful metric for evaluating the distribution of noise events over time. For example, the L_{10} represents the noise level exceeded 10% of the time and is a useful descriptor for transient events like individual vehicle drive-bys. The L_{90} represents the noise level exceeded 90% of the time and is a useful descriptor to isolate continuous noise sources.

The statistical summary of L_{EQ} spectra recorded at Location LT-1 is presented in Figure 5 in 1/3-octave band resolution. The short-term L_{EQ} spectra recorded at Locations ST-1 through ST-5 are presented in Figure 6 in 1/3-octave band resolution

4. Noise Survey Results

The long-term noise data at each site are summarized in Table 1 below.

Table 1: Summary of Long-Term Measurement Results

	24-Hour Day/Night Level (L_{DN}) in Decibels (dBA)				
Location	**May 12**	**May 13**	**May 14**	**May 15**	**Average**
LT-1	69	66	64	64	66
LT-2	67	65	65	67	66
LT-3	62	60	61	63	62
LT-4	61	61	63	63	62

Table 2 summarizes the short-term measurement results at the BAE shipyard.

Table 2: Summary of Short-Term Measurement Results

Location	Activity/Source	L_{EQ} (dBA)	L_{MAX} (dBA)
ST-1	Dry Dock Repair	77	81
ST-2	Generators	81	82
ST-3	Dry Dock Repair	76	84
ST-4	General Dock	66	71
ST-4	Fire Pump	77	78
ST-5	Boiler Building	76	76

We make the following comments in regards to the recorded noise data:

- The site is only moderately noisy, with an average L_{DN} of 62 to 66 dBA. These levels are somewhat quieter than is typical for light industrial/urban mixed-use locations. It is apparent that existing buildings provide significant shielding of ship repair related noise at locations LT-3 and LT-4 vs. locations LT-1 and LT-2.

- The short-term measurements at the ship repair docks reveal that the general noise character of the repair work is broadband without significant tonality. The lack of strong tonality results in the noise being perceived as less annoying than a similar noise level from a tonal source, such as a transformer or chiller. The fire pump at the western end of the dock runs continuously and has significant tonality; however, the pump was not audible over the ambient conditions at any of the long-term measurement conditions and in fact, is barely detectable in the short-term measurement made nearby at the western end of the ship repair docks. Another mildly tonal source is the Aggrecko generators located between Dry Dock 2 and Dock 4 East; the generators create tones at 125 Hz and 500 Hz. We understand that these would be removed from the site if a proposed electric infrastructure upgrade is constructed.

- At locations LT-1 and LT-2, the noise environment appears to be very constant and is clearly influenced by the ship repair activities. In the L_{90} spectrum (Figure 5), the 125 and 500 Hz tones from the generators are clearly visible.

- At location LT-3, the noise environment varies significantly from day to nighttime hours, particularly when Sims is operational. While not shown, the 125 and 500 Hz tones from the generators are clearly visible in the L_{90} spectrum. However, the higher frequencies are much quieter than at LT-1 and LT-2, likely due to the shielding provided by building 6.
- At location LT-4, the noise environment also varies significantly from day to nighttime hours. Both the time history and spectra are consistent with environments controlled by vehicular traffic. No evidence of the generators or other components of the ship repair activities are visible in the spectra.

5. Site Noise Criteria

The State of California has established a requirement that the interior noise levels in residential dwellings from exterior sources be limited to 45 dBA L_{DN}. To provide for simplified enforcement of this requirement, the State developed guidelines for determining residential compatibility in differing environments. The Guidelines are formatted into categories of "Normally Acceptable", "Conditionally Acceptable", "Normally Unacceptable", and "Clearly Unacceptable" and encompass all forms of residential uses – single-family, multi-family, and apartments/rentals. To determine which category the site falls into, long-term (24+ hour) measurements are conducted at the proposed site and evaluated against the categories. For the "Conditionally Acceptable" and "Normally Unacceptable" categories, development should only be undertaken after a noise analysis has been performed and any necessary noise reduction elements incorporated into the design.

The City of San Francisco has adopted compatibility guidelines very similar to the State guidelines as part of the General Plan (Policy 11.1) The Plan states the following:

- L_{DN} values of 60 dBA or less are "Satisfactory", meaning there would be no special noise insulation measures required.
- For areas with L_{DN} values between 60 and 70 dBA, new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
- For areas with L_{DN} values exceeding 65 dBA[1], new construction or development should generally be discouraged. If new construction does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

[1] Varying from the State guidelines, the City of San Francisco has adopted an overlapping set of guidelines.

6. Site Feasibility Determination

City of San Francisco/California Building Code Compatibility

Based on the data presented in this report, the L_{DN} at the four long-term locations varied from 60 to 69 dBA, with an average of 62 dBA at locations LT-3 and LT-4, and an average of 66 dBA at locations LT-1 and LT-2. When compared to the City of San Francisco compatibility guidelines, all four locations fall within the categories requiring a detailed analysis of noise reduction requirements and needed noise insulation features included in the design. The needed noise insulation features could include selecting glazing with higher noise reduction, improving exterior wall construction, adapting the layout of interior spaces and/or location of windows to general site planning. In addition, open windows could not be solely relied upon for ventilation.

For outdoor use areas, we would anticipate only minor to moderate shielding requirements to reduce the exterior noise levels to 60 dBA or less. The 60 dBA threshold is commonly used as the maximum noise level before speech intelligibility significantly decreases, although this is not a Code concern.

Given the moderate noise levels at the site, the mitigation measures should not require exotic or unusual construction methods or materials. It should be noted that the noise environment in large areas of the City is of a similar noise level or even higher. As noted under Measurement Locations, location LT-4 was close to an approved multi-family residential project under construction. Figure 7 presents a noise map commissioned by the City of San Francisco. As can be seen, nearby residential areas have similar or higher ambient noise levels than the potential Pier 70 residential locations.

Character of Noise at Site

While not a Code matter, understanding the subjective noise character of the site can be useful in determining the suitability for residential uses. The general character of the noise environment at the potential locations for residential development is typical light industrial/urban mixed-use with a continuous background level from traffic in the distance. The noise from ship repair activities is generally broadband and inoffensive in character. At location LT-1, there are no other buildings to block the line-of-sight from Dry Dock 2; therefore, more high frequency energy from activities, such as water blasting or painting, is present and audible. At locations LT-1, LT-2, and LT-3, noise from the generators is also significant. As we understand it, an upgrade to the electrical infrastructure at BAE has been proposed; this upgrade would remove the generators from service.

7. Conclusion

Based on the data presented in this report, the noise character at the site is generally similar to many areas of San Francisco. It is expected that the California Building Code interior noise level requirements could be met with common mitigation measures to increase the noise reduction of the exterior façade and outdoor use areas would be possible with minor to moderate shielding requirements. The noise from ship repair activities is generally broadband and inoffensive in character. Given these factors, the site should be considered acceptable for the development of multi-family residential housing.

• • •

Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at tyler@va-consult.com.

Sincerely,



Tyler Rynberg, PE

Vibro-Acoustic Consultants

Figure 0: Pier 70 Residential Feasibility Study – 11-17 May 2012
Noise Measurement Locations

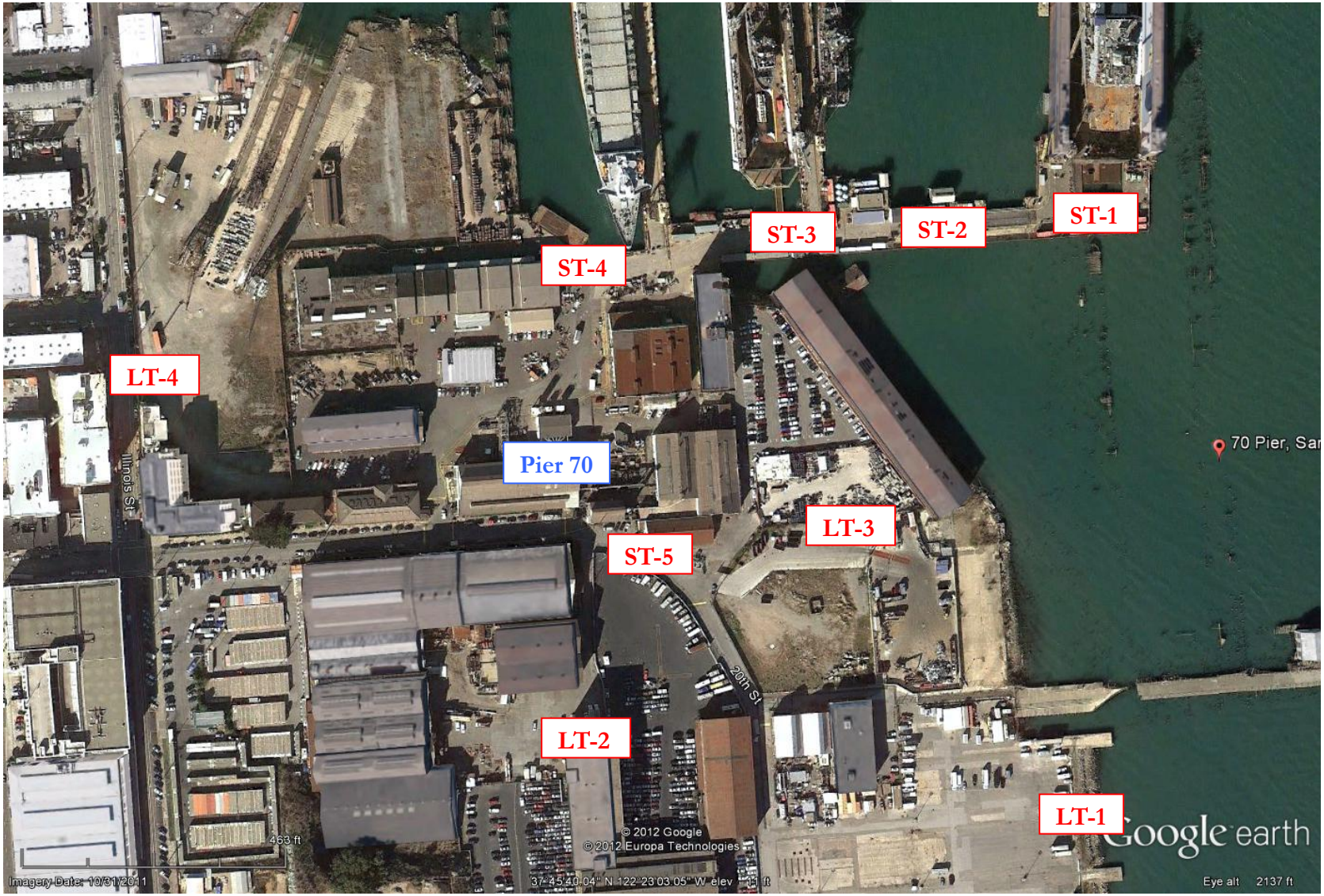


Figure 1: Pier 70 Residential Feasibility Study – 11-17 May 2012
Time History of Noise Levels over 96-hour Period at Location LT-1 (Slip 5/6)

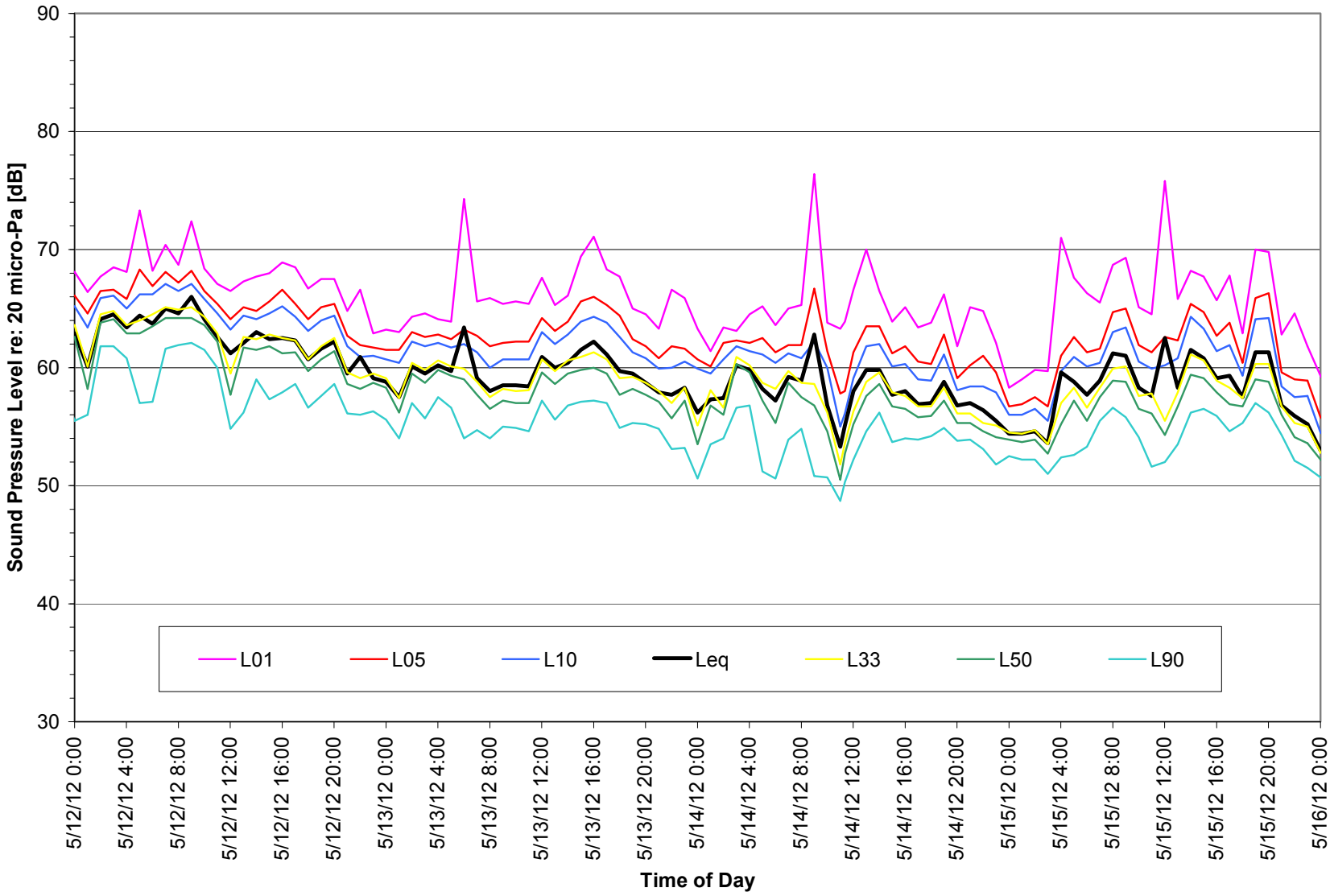


Figure 2: Pier 70 Residential Feasibility Study – 11-17 May 2012
Time History of Noise Levels over 96-hour Period at Location LT-2 (Building 2 Roof)

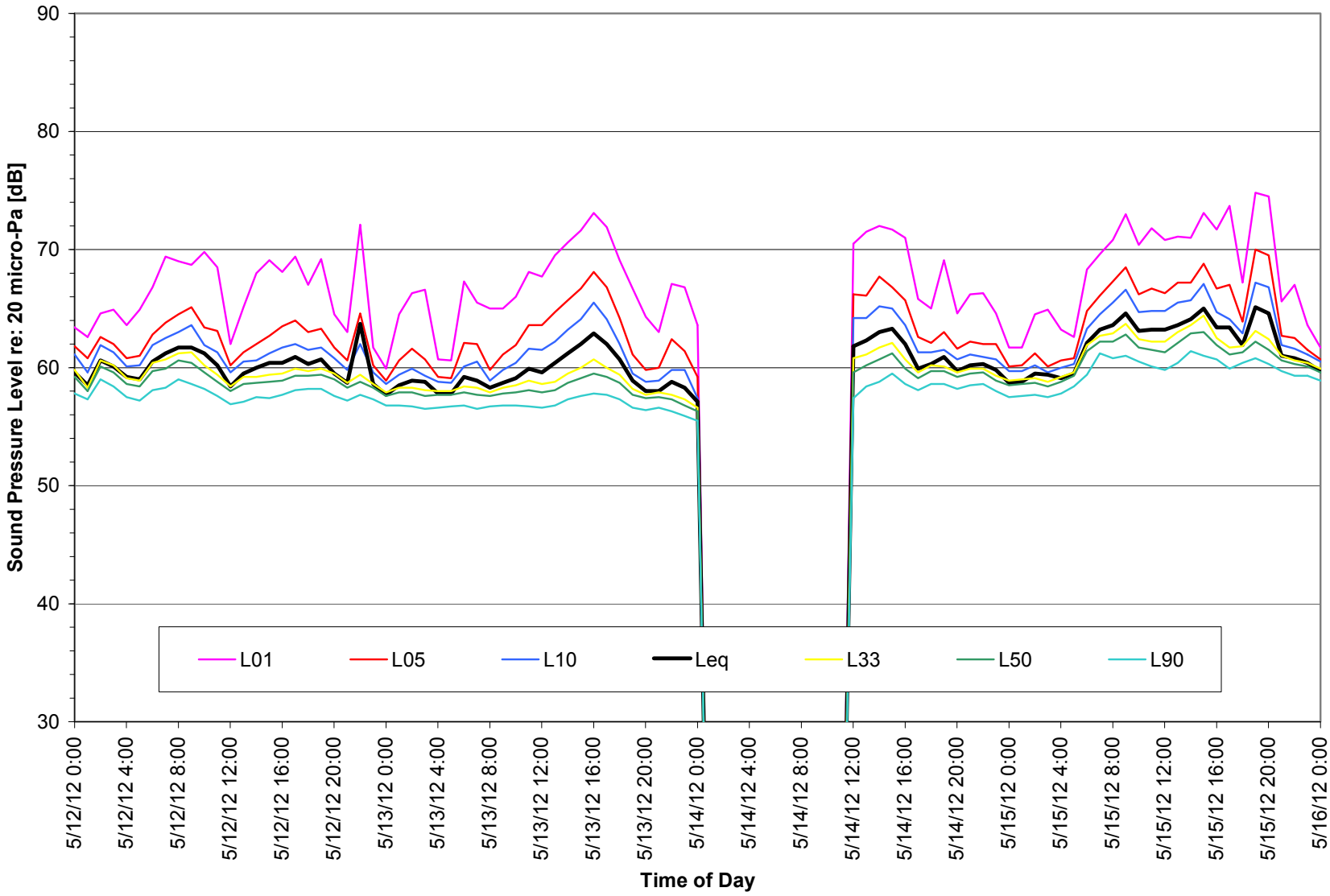


Figure 3: Pier 70 Residential Feasibility Study – 11-17 May 2012
Time History of Noise Levels over 96-hour Period at Location LT-3 (Sims Metal Management South of Building 6)

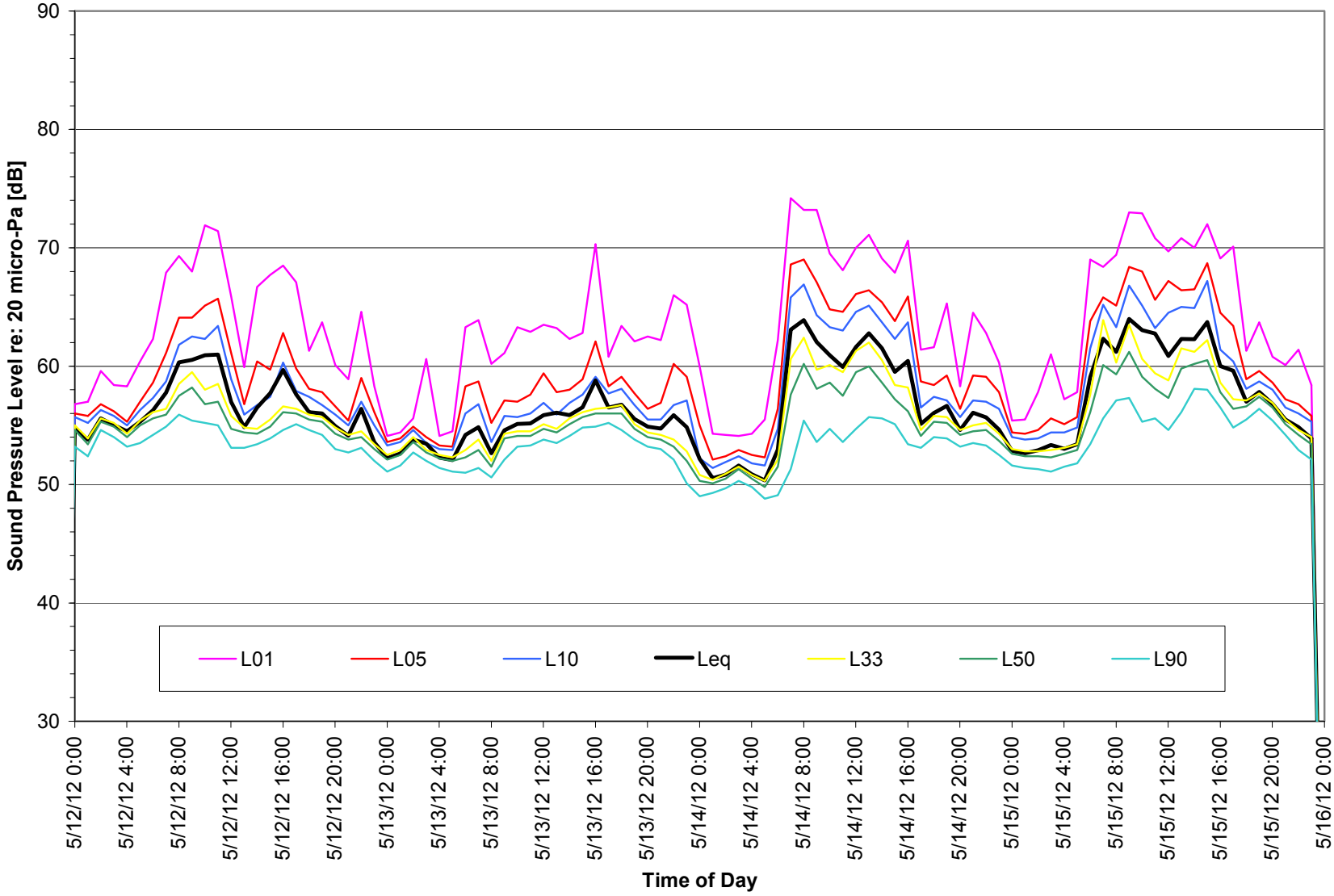


Figure 4: Pier 70 Residential Feasibility Study – 11-17 May 2012
Time History of Noise Levels over 96-hour Period at Location LT-4 (Illinois Street North of Building 131)

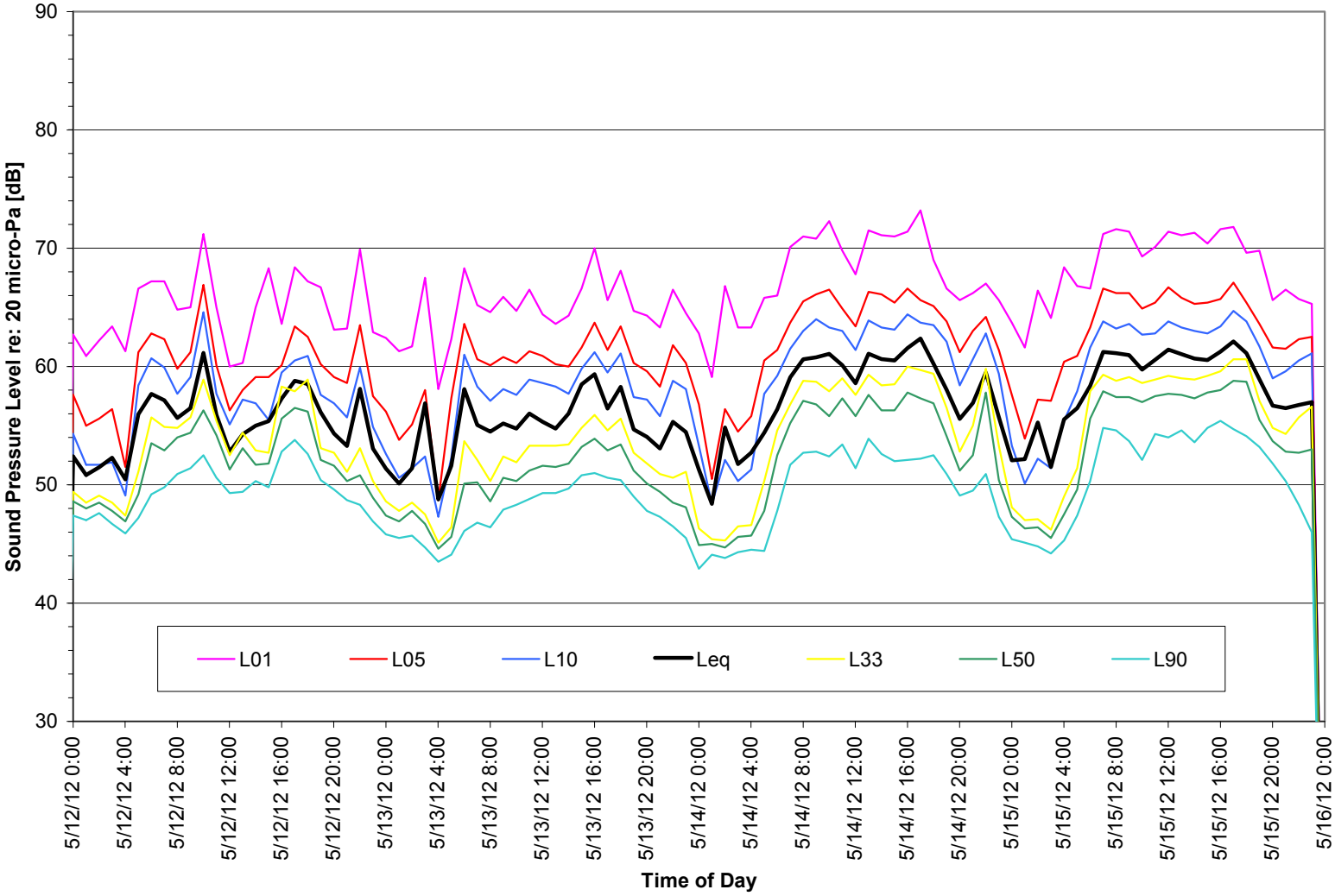


Figure 5: Pier 70 Residential Feasibility Study – 11-17 May 2012
Statistical Summary of Spectra over 96-Hour Period at Location LT-1

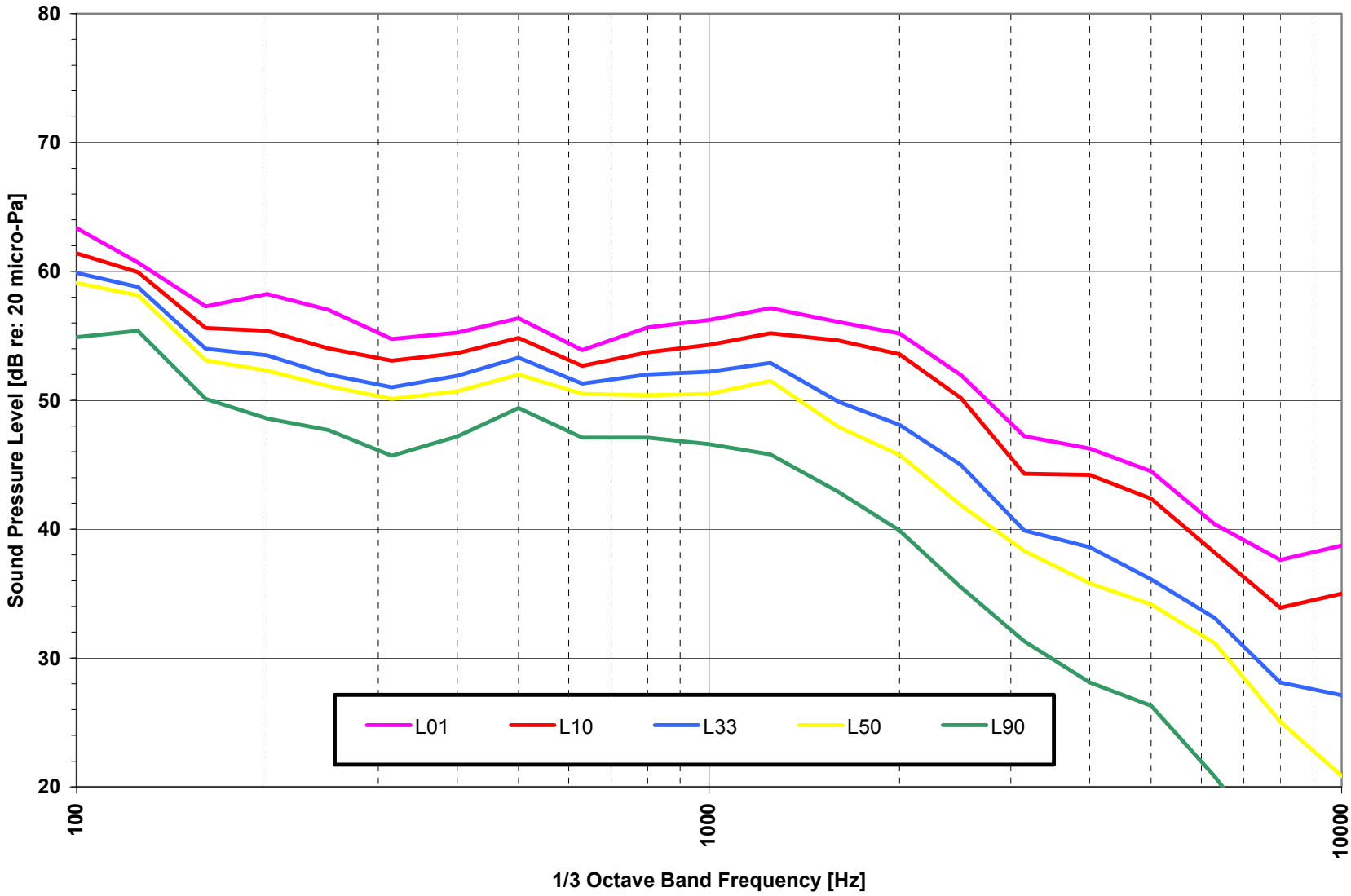


Figure 6: Pier 70 Residential Feasibility Study – 11-17 May 2012
Short-Term Ship Repair Facility Noise Levels at Locations ST-1 through ST-5

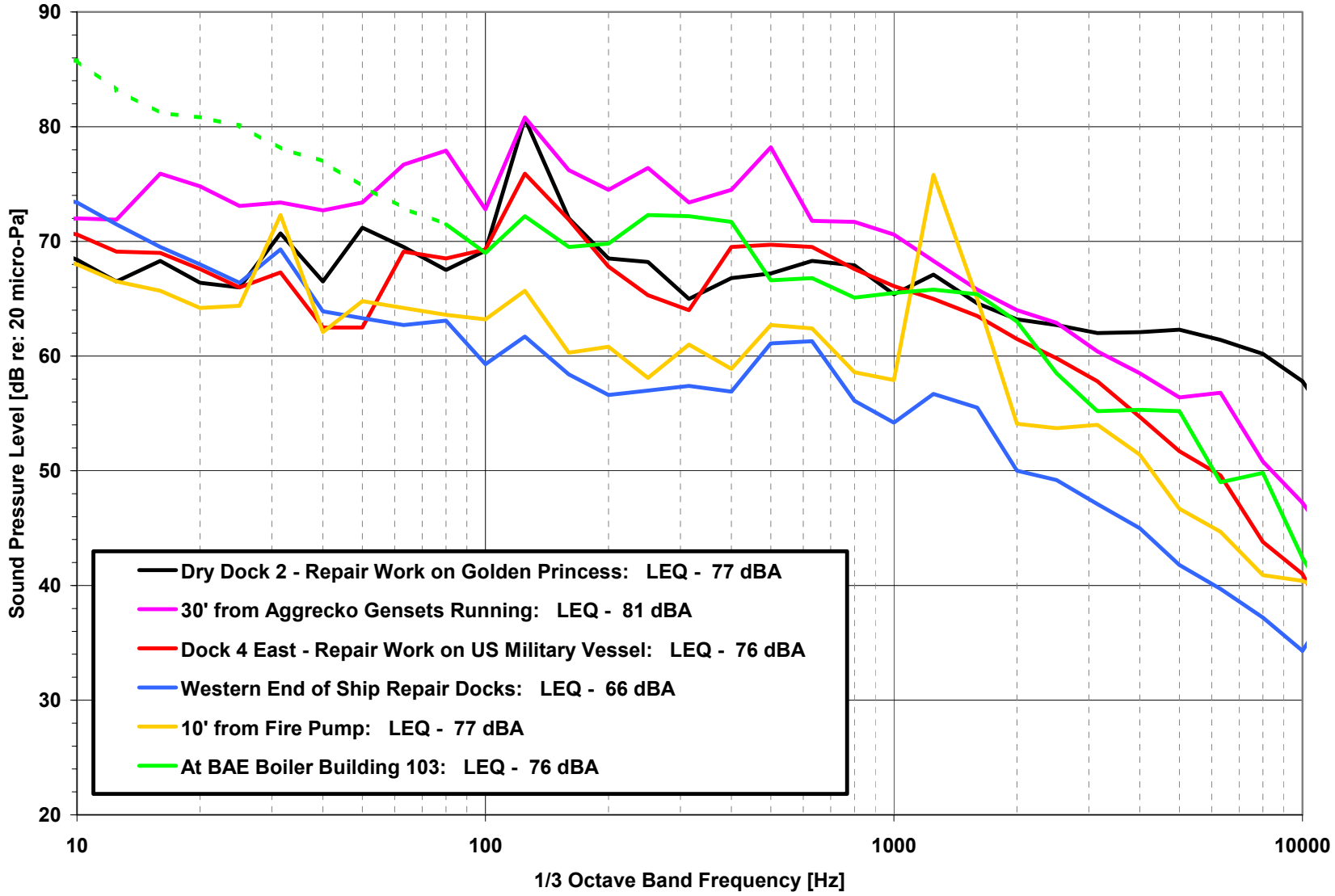
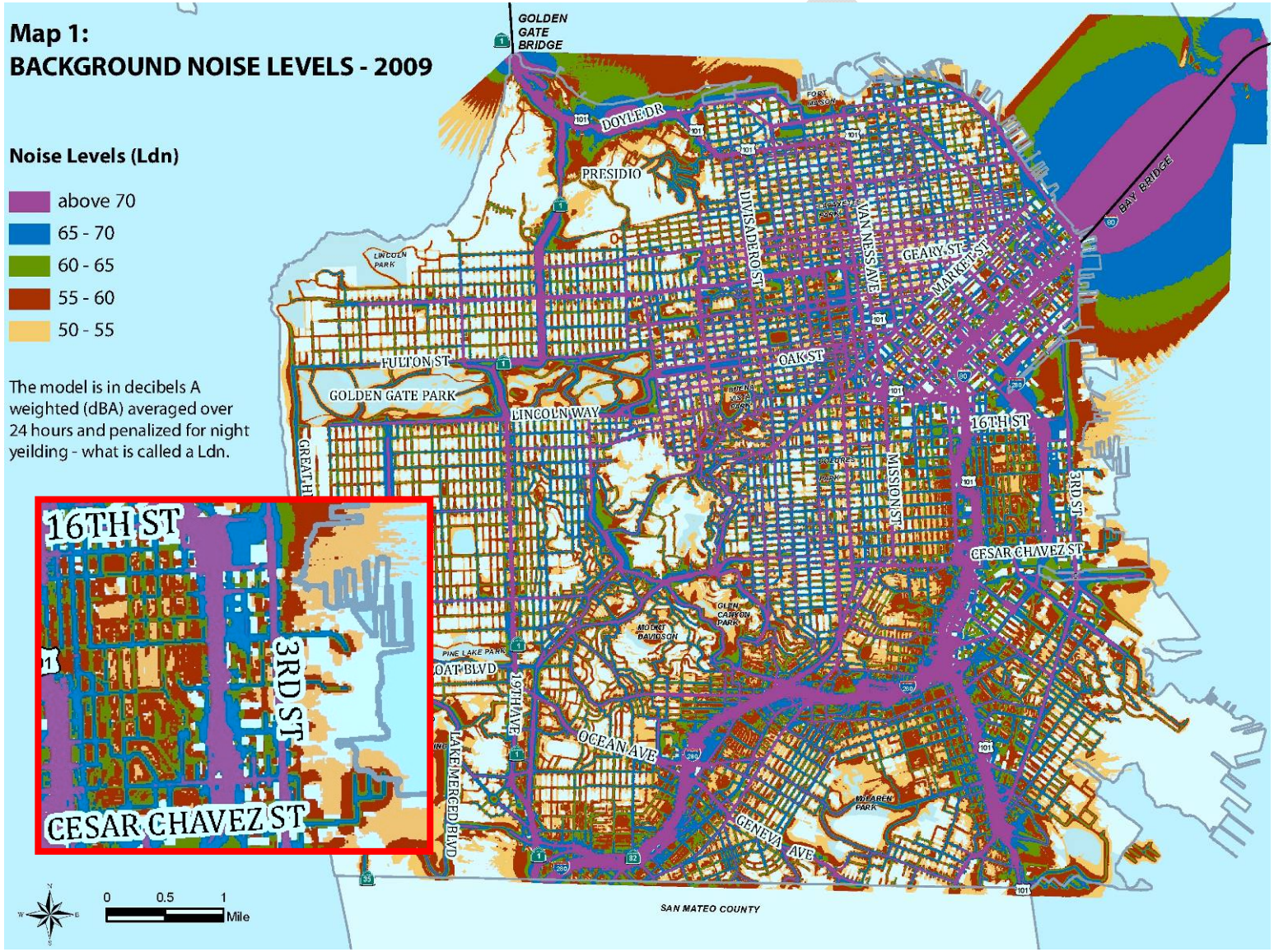


Figure 7: Pier 70 Residential Feasibility Study – 11-17 May 2012
Noise Map Commissioned by City of San Francisco



Session Report

4/6/2015

Information Panel

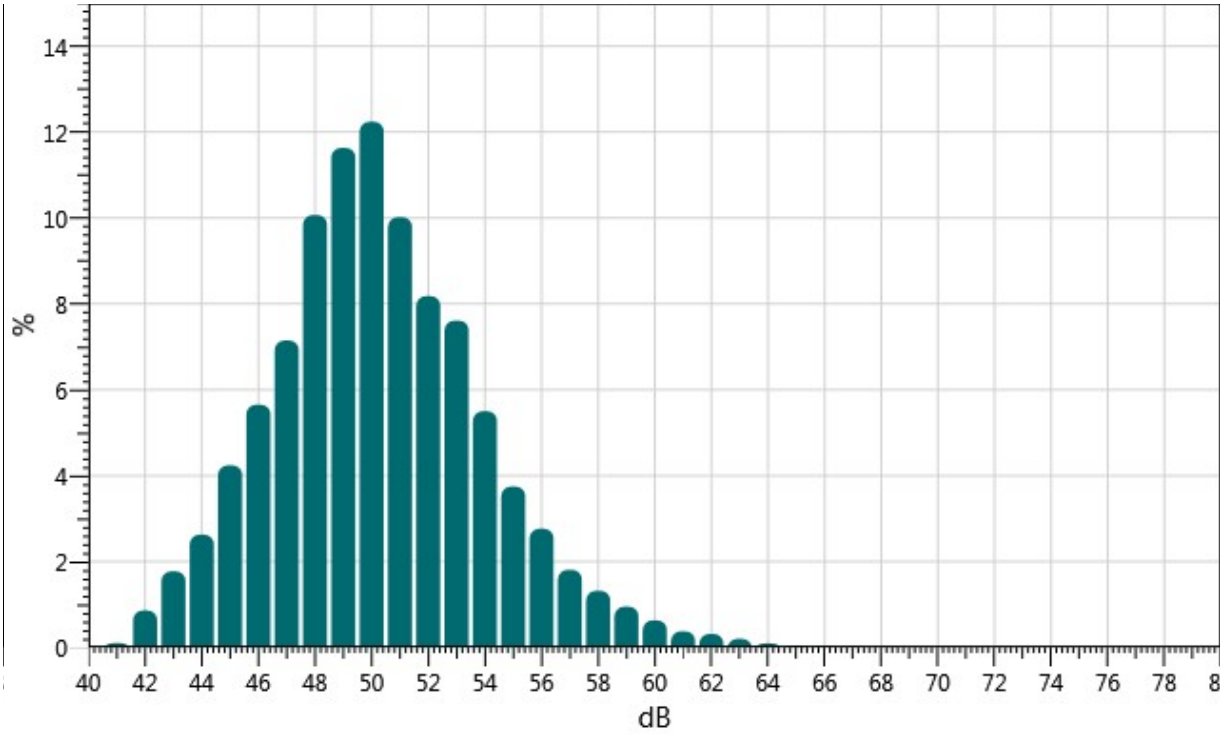
Name	S021_BGF100003_05042015_171527
Start Time	4/2/2015 12:00:00 AM
Stop Time	4/4/2015 12:10:00 AM
Device Name	BGF100003
Model Type	SoundPro DL
Device Firmware Rev	R.12L
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	52.6 dB	CNEL	1	58.3 dB
L10	1	55.4 dB	L50	1	50.3 dB
L90	1	45.9 dB	LDN	1	57.9 dB
Lmax	1	74.7 dB	Lmin	1	41.1 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF

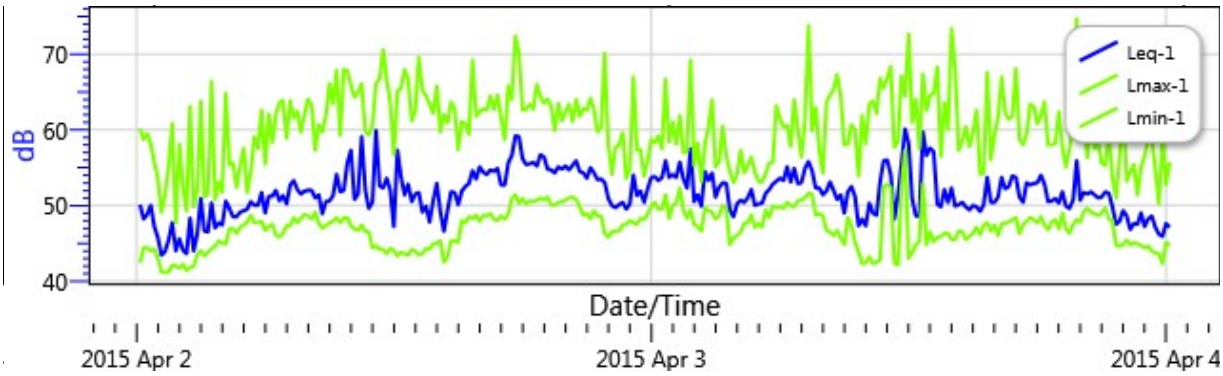
Statistics Chart

S021_BGF100003_05042015_171527: Statistics Chart



Logged Data Chart

S021_BGF100003_05042015_171527: Logged Data Chart



Session Report

8/21/2015

Information Panel

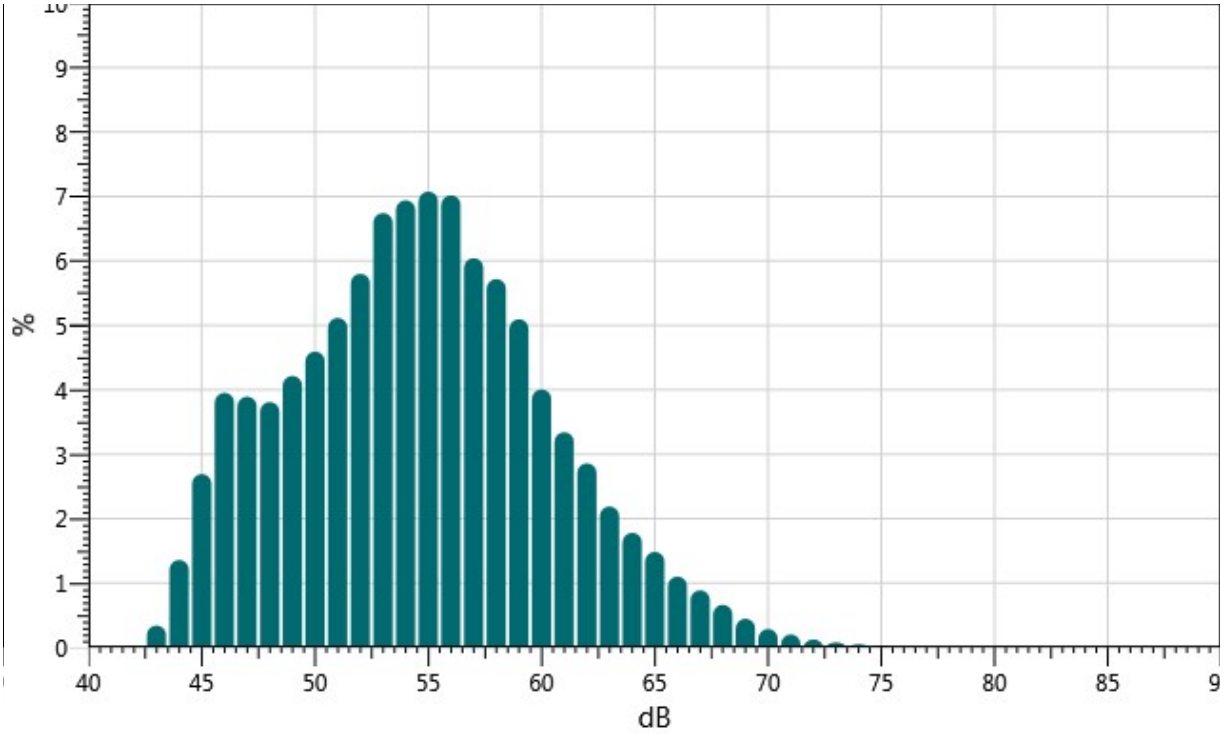
Name	ImPark parking lot
Start Time	8/18/2015 12:00:00 AM
Stop Time	8/20/2015 12:10:00 AM
Device Name	BGF100004
Model Type	SoundPro DL
Device Firmware Rev	R.12L
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	59.3 dB	CNEL	1	63.9 dB
L50	1	54.9 dB	L90	1	47.3 dB
LDN	1	63.7 dB	Lmax	1	81.9 dB
Lmin	1	42.2 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW			

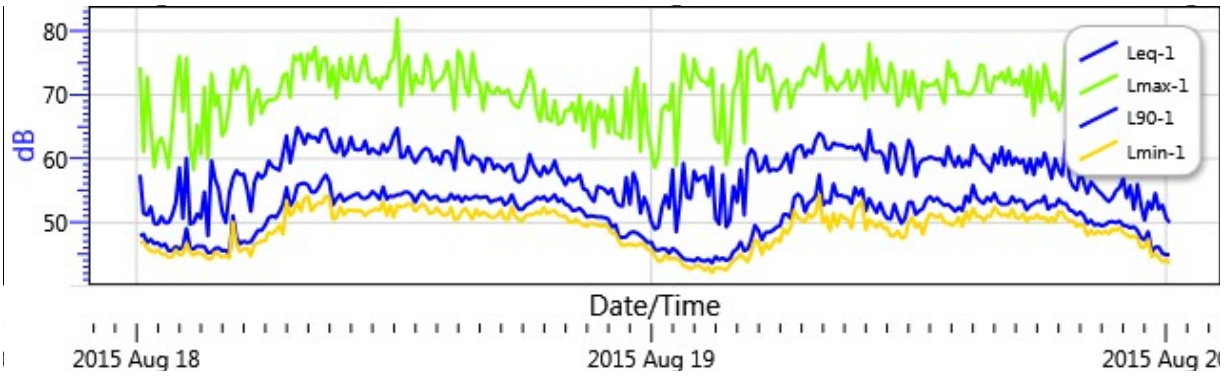
Statistics Chart

S048_BGF100004_21082015_152408: Statistics Chart



Logged Data Chart

S048_BGF100004_21082015_152408: Logged Data Chart



Session Report

8/21/2015

Information Panel

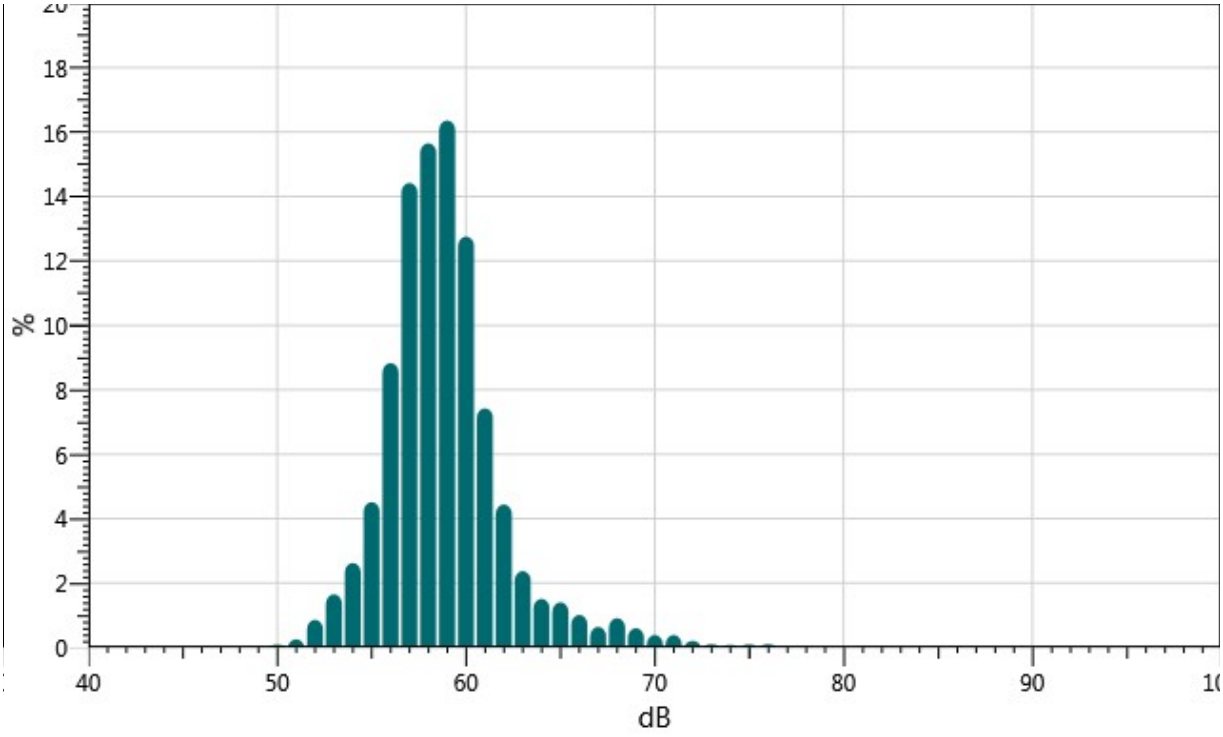
Name	PG&E Hoedown Yard
Start Time	8/18/2015 12:00:00 AM
Stop Time	8/20/2015 12:10:00 AM
Device Name	BGF100003
Model Type	SoundPro DL
Device Firmware Rev	R.12L
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	62.6 dB	L50	1	58.9 dB
CNEL	1	67.4 dB	L90	1	55.8 dB
LDN	1	67.3 dB	Lmax	1	93.1 dB
Lmin	1	49.1 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW			

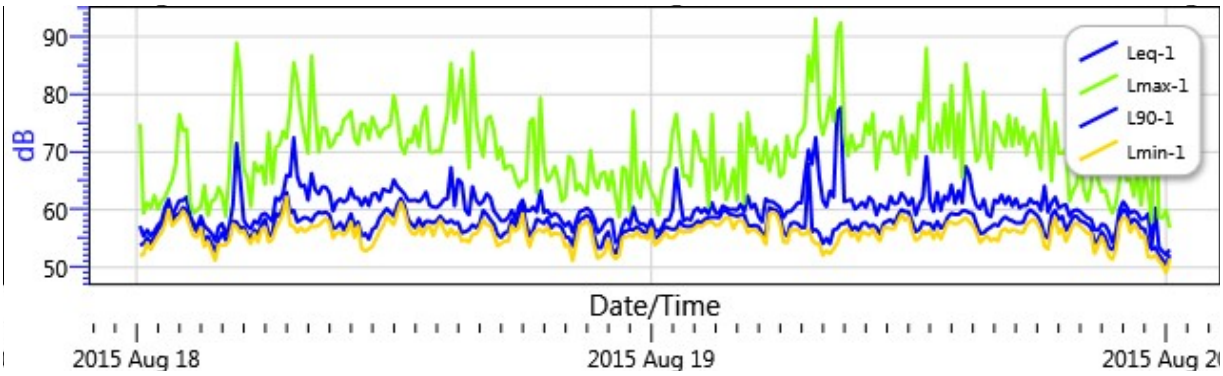
Statistics Chart

S026_BGF100003_21082015_142503: Statistics Chart



Logged Data Chart

S026_BGF100003_21082015_142503: Logged Data Chart



Attachment 2

PROJECT ON-SITE NOISE EXPOSURE BY PARCEL

Attachment 2: Estimated Project On-Site Noise Exposure by Parcel

Future On-Site Noise Exposure by Project Parcel													
Proposed Building/Parcel	**Façade**	**Minimum Building Setback from CL (feet)**	**Min. Measured or Estimated Ambient Noise Level**	**Max. Measured or Estimated Ambient Noise Level**	**Traffic Noise Level at 50' fr. CL**	**Adj. Traffic Noise Level at Minimium Setback**	**Minimum Combined Noise Level at Receptor**	**Maximum Combined Noise Level at Receptor**	**Max Res Maximum Acceptable Noise Level**	**Max Res Max Conditionally Acceptable Noise Level**	**Max Com Maximum Acceptable Noise Level**	**Max Com Max Conditionally Acceptable Noise Level**	**Designated Use Max Res/Max Com**
28-Acre Site													
Parcel A	N	30	60	66	65	67	68	70	70	75	70	75	Commercial Office/Com Office
	E	30	60	66	61	64	65	68	70	75	70	75	Com Office/Com Office
	S	23	60	66	65	68	69	70	70	75	70	75	Com Office/Com Office
	W	-	60	66	0	0	60	66	70	75	70	75	Com Office/Com Office
Parcel B	N	30	60	66	63	65	66	69	70	75	70	75	Com Office/Com Office
	E	19	60	66	60	64	66	68	70	75	70	75	Com Office/Com Office
	S	23	60	66	63	66	67	69	70	75	70	75	Com Office/Com Office
	W	30	60	66	61	64	65	68	70	75	70	75	Com Office/Com Office
Parcel C1	N	23	58	66	66	69	70	**71**	70	75	70	75	Com Office or Resid/Com Office
	E	19	58	66	62	66	67	69	70	75	70	75	Com Office/Com Office
	S	-	58	66	0	0	58	66	70	75	70	75	Com Office/Com Office
	W	350	58	66	66	58	61	67	70	75	70	75	Com Office/Com Office
Parcel C2	N	-	58	66	0	0	58	**66**	60	70	60	70	Residential/Residential
	E	19	58	66	62	66	**67**	**69**	60	70	60	70	Residential/Residential
	S	30	58	66	66	68	**69**	**70**	60	70	60	70	Residential/Residential
	W	550	58	66	64	54	59	**66**	60	70	60	70	Residential/Residential
Parcel D	N	23	66	66	65	68	**70**	**70**	60	70	60	70	Residential/Residential
	E	30	66	66	60	62	**68**	**68**	60	70	60	70	Residential/Residential
	S	-	66	66	0	0	**66**	**66**	60	70	60	70	Residential/Residential
	W	-	66	66	0	0	**66**	**66**	60	70	60	70	Residential/Residential
Parcel E1	N	23	66	66	63	66	**69**	**69**	60	70	60	70	Residential/Residential
	E	-	66	66	0	0	**66**	**66**	60	70	60	70	Residential/Residential
	S	-	66	66	0	0	**66**	**66**	60	70	60	70	Residential/Residential
	W	30	66	66	60	62	**68**	**68**	60	70	60	70	Residential/Residential
Parcel E2	N	-	58	66	0	0	58	**66**	60	70	60	70	Residential/Residential
	E	-	58	66	0	0	58	**66**	60	70	60	70	Residential/Residential
	S	30	58	66	60	62	**64**	**68**	60	70	60	70	Residential/Residential
	W	30	58	66	60	62	**64**	**68**	60	70	60	70	Residential/Residential
Parcel E3	N	-	58	66	0	0	58	**66**	60	70	60	70	Residential/Residential
	E	-	58	66	0	0	58	**66**	60	70	60	70	Residential/Residential
	S	30	58	66	60	62	**64**	**68**	60	70	60	70	Residential/Residential
	W	-	58	66	0	0	58	**66**	60	70	60	70	Residential/Residential
Parcel F	N	30	58	66	66	68	**69**	**70**	60	70	70	75	Residential/Com Office
	E	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	S	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	W	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
Parcel G	N	30	58	66	64	67	**67**	**69**	60	70	70	75	Residential/Com Office
	E	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	S	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	W	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
Parcel H1	N	30	58	66	60	62	**64**	**68**	60	70	70	75	Residential/Com Office
	E	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	S	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	W	30	58	66	55	58	**61**	**67**	60	70	70	75	Residential/Com Office
Parcel H2	N	30	58	66	60	62	**64**	**68**	60	70	70	75	Residential/Com Office
	E	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	S	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office
	W	-	58	66	0	0	58	**66**	60	70	70	75	Residential/Com Office

Attachment 2: Estimated Project On-Site Noise Exposure by Parcel (Continued)

Future On-Site Noise Exposure by Project Parcel													
Proposed Building/Parcel	**Façade**	**Minimum Building Setback from CL (feet)**	**Min. Measured or Estimated Ambient Noise Level**	**Max. Measured or Estimated Ambient Noise Level**	**Traffic Noise Level at 50' fr. CL**	**Adj. Traffic Noise Level at Minimum Setback**	**Minimum Combined Noise Level at Receptor**	**Maximum Combined Noise Level at Receptor**	**Max Res Maximum Acceptable Noise Level**	**Max Res Max Conditionally Acceptable Noise Level**	**Max Com Maximum Acceptable Noise Level**	**Max Com Max Conditionally Acceptable Noise Level**	**Designated Use Max Res/Max Com**
28-Acre Site													
Building 2	N	23	66	66	65	68	70	**70**	60	70	70	75	Residential/Com Office
	E	-	66	66	0	0	**66**	**66**	60	70	70	75	Residential/Com Office
	S	-	66	66	0	0	**66**	**66**	60	70	70	75	Residential/Com Office
	W	19	66	66	62	66	**69**	**69**	60	70	70	75	Residential/Com Office
Parcel E4	N	23	66	66	63	66	69	69	77.5	87.5	77.5	87.5	Creative Retail (RALI)/RALI
	E	-	66	66	0	0	66	66	77.5	87.5	77.5	87.5	RALI/RALI
	S	-	66	66	0	0	66	66	77.5	87.5	77.5	87.5	RALI/RALI
	W	-	66	66	0	0	66	66	77.5	87.5	77.5	87.5	RALI/RALI
Building 12	N	-	58	66	0	0	58	66	77.5	87.5	77.5	87.5	RALI/RALI
	E	30	58	66	60	62	64	68	77.5	87.5	77.5	87.5	RALI/RALI
	S	30	58	66	64	67	67	69	77.5	87.5	77.5	87.5	RALI/RALI
	W	19	58	66	62	66	67	69	77.5	87.5	77.5	87.5	RALI/RALI
Building 21	N	-	66	66	0	0	66	66	77.5	87.5	77.5	87.5	RALI/RALI
	E	-	66	66	0	0	66	66	77.5	87.5	77.5	87.5	RALI/RALI
	S	-	66	66	0	0	66	66	77.5	87.5	77.5	87.5	RALI/RALI
	W	-	66	66	0	0	66	66	77.5	87.5	77.5	87.5	RALI/RALI
Parcel C1 Roof	N	23	58	66	66	69	70	**71**	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	E	19	58	66	62	66	67	69	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	S	-	58	66	0	0	58	66	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	W	350	58	66	66	58	61	67	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
Parcel C2 Roof	N	-	58	66	0	0	58	66	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	E	19	58	66	62	66	67	69	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	S	30	58	66	66	68	69	70	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	W	550	58	66	66	56	60	66	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
Waterfront Promenade	N	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	E	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	S	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	W	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
Waterfront Terrace	N	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	E	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	S	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	W	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
Slipway Commons	N	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	E	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	S	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
	W	-	58	66	0	0	58	66	75	85	75	85	Water-based Rec/Water-based Rec
Building 12 Market	N	-	66	66	0	0	66	66	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
Plaza / Square	E	30	66	66	60	62	68	68	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	S	-	66	66	0	0	66	66	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	W	-	66	66	0	0	66	66	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
Illinois Parcels													
Parcel PKN	N	98	62	64	65	62	**65**	**66**	60	70	60	70	Residential/Residential
	E	38	62	64	61	63	**65**	**66**	60	70	60	70	Residential/Residential
	S	19	62	64	67	71	**71**	**72**	60	70	60	70	Residential/Residential
	W	35	62	64	65	66	**68**	**68**	60	70	60	70	Residential/Residential
Parcel PKS	N	19	62	64	67	71	**71**	**72**	60	70	60	70	Residential/Residential
	E	-	62	64	0	0	**62**	**64**	60	70	60	70	Residential/Residential
	S	-	62	64	0	0	**62**	**64**	60	70	60	70	Residential/Residential
	W	35	62	64	66	68	**69**	**69**	60	70	60	70	Residential/Residential

Attachment 2: Estimated Project On-Site Noise Exposure by Parcel (Continued)

Future On-Site Noise Exposure by Project Parcel

Proposed Building/Parcel	Façade	Minimum Building Setback from CL (feet)	Min. Measured or Estimated Ambient Noise Level	Max. Measured or Estimated Ambient Noise Level	Traffic Noise Level at 50' fr. CL	Adj. Traffic Noise Level at Minimum Setback	Minimum Combined Noise Level at Receptor	Maximum Combined Noise Level at Receptor	Max Res Maximum Acceptable Noise Level	Max Res Max Conditionally Acceptable Noise Level	Max Com Maximum Acceptable Noise Level	Max Com Max Conditionally Acceptable Noise Level	Designated Use Max Res/Max Com
Illinois Parcels													
Parcel HDY*	N	-	*62*	*64*	0	0	**62**	**64**	60	70	70	75	Residential/Com Office
	E	-	*62*	*64*	0	0	**62**	**64**	60	70	70	75	Residential/Com Office
	S	30	*62*	*64*	66	68	**69**	**70**	60	70	70	75	Residential/Com Office
	W	35	*62*	*64*	66	68	**69**	**69**	60	70	70	75	Residential/Com Office
20th Street Plaza	N	30	62	64	65	67	**68**	**69**	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	E	-	62	64	0	0	62	64	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	S	-	62	64	0	0	62	64	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	W	35	62	64	65	66	68	68	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
Irish Hill Playground	N	19	62	64	67	71	71	72	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	E	-	62	64	0	0	62	64	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	S	-	62	64	0	0	62	64	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds
	W	35	62	64	66	68	69	69	70	77.5	70	77.5	Parks-Playgrds/Parks-Playgrnds

Notes: Noise levels in **Bold** exceed Maximum Acceptable Noise Levels, but do not exceed Maximum Conditionally Acceptable Noise Levels for the proposed uses, indicating that incorporation of supplemental noise attenuation measures would be adequate to reduce interior noise levels to acceptable levels. Noise levels in **Red Bold** exceed both Maximum Acceptable Noise Level and Maximum Conditionally Acceptable Noise Levels for the proposed uses, indicating that additional noise attenuation measures may be needed to meet the 45-dBA interior standard with open windows.

*Ambient noise levels for Parcel HDY are estimated based on measurements collected along Illinois to the north because measurements at Parcel HDY included noise from heavy equipment operations associated with the existing PG&E corporation yard activities. These operations would cease on this parcel when this parcel is redeveloped as part of project implementation, but transformer noise from the PG&E substation would continue.

Estimated On-Site Traffic Noise Levels

Street	Segment or Cross-Street	ADT	With Maximum Future With Project Noise Level Ldn/CNEL at 50' from CL	With +3 dBA Echo Adjustmt.
20th Street	E of Illinois	14,000	65	65
	W of Louisiana Ext.	12,000	63	66
	W of Maryland	9,000	62	65
	E of Maryland	6,000	60	63
21st Street (new)	E of Illinois	14,000	64	67
	W of Louisiana	12,000	63	66
	W of Maryland	9,000	62	65
	E of Maryland	6,000	60	63
22nd Street	E of Illinois	12,000	63	66
	W of Maryland	8,000	61	64
	E of Maryland	3,000	57	60
Unnamed St/E of PKN	20th-21st	4,000	58	61
Louisiana Street	21st-22nd	5,000	59	62
Maryland Street	20th-21st	4,000	58	61
	21st-22nd	3,000	57	60
	S of 22nd	1,000	52	55
Unnamed St/E of B2	20th-21st	3,000	57	60

NOTES:
"CL": Roadway Centerline
"With +3 dBA Echo Adjustment": 3 dBA was added where roadway widths were 45 feet or less and adjacent buildings were taller than two stories to account for noise reflection or "echo" effect.

APPENDIX D: AIR QUALITY TECHNICAL REPORT

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PIER 70 MIXED-USE DISTRICT PROJECT
SAN FRANCISCO, CALIFORNIA

Air Quality Technical Report

Prepared for:
San Francisco Planning Department

December 2016

ESA

PIER 70 MIXED-USE DISTRICT PROJECT
SAN FRANCISCO, CALIFORNIA

Air Quality Technical Report

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PIER 70 MIXED-USE DISTRICT PROJECT

Air Quality Technical Report

I. Executive Summary

This report has been prepared as a resource document for the San Francisco Planning Department as part of its environmental review for the proposed Pier 70 Mixed-Use District Project (Proposed Project).

This analysis uses tools and methodology established as part of the Bay Area Air Quality Management District (BAAQMD) CEQA Air Quality Guidelines to identify criteria air pollutant emission increases and increases in health risks and hazards related to the Proposed Project.

The analysis is divided into two primary discussions: criteria air pollutants and community health risks and hazards. Criteria air pollutants from construction and operation of the Proposed Project are described separately. Community risk and hazards impacts are addressed by conducting a Health Risk Assessment for the Proposed Project. The analysis examines two project scenarios: a Maximum Residential Scenario and a Maximum Commercial Scenario. The analysis finds the following:

- **Construction Emissions of the Maximum Residential Scenario:** Maximum average daily uncontrolled emissions of the various criteria air pollutants during the construction of the Maximum Residential Scenario, by pollutant and Phase, would be 25 pounds per day of reactive organic gases (ROG) in Phase 4, 42 pounds per day of nitrogen oxides (NO_x) in Phases 1 and 2, and 1.9 pounds per day of particulate matter (PM_{10}) and 1.8 pounds per day of fine particulate matter ($PM_{2.5}$) in Phases 1 and 2.
- **Construction Emissions of the Maximum Commercial Scenario:** Maximum average daily uncontrolled emissions of the various criteria air pollutants during the construction of the Maximum Commercial Scenario, by pollutant and Phase, would be 25 pounds per day of reactive organic gases (ROG) in Phase 2 and 42 pounds per day of nitrogen oxides (NO_x), and 1.9 pounds per day of particulate matter (PM_{10}) and 1.8 pounds per day of fine particulate matter ($PM_{2.5}$) all during the simultaneous construction of Phases 1 and 2.
- **Maximum Emissions from Both Construction and Operation Overall:** Overall maximum emissions (both construction and operation) would occur during construction of Phase 5 of the Maximum Commercial Scenario, when maximum average daily uncontrolled emissions of criteria air pollutants would be 171 pounds per day of reactive organic gases (ROG), 111 pounds per day of nitrogen oxides (NO_x), and 88 pounds per day of particulate matter (PM_{10}) and 28 pounds per day of fine particulate matter ($PM_{2.5}$), including occupancy and operational emissions from of Phases 1 through 4. The maximum emissions of the Maximum Residential Scenario would be marginally less.

- **Full Build-Out Emissions of the Maximum Residential Scenario:** Uncontrolled annual emissions of criteria air pollutants during operation of the Proposed Project after completion of all five phases of the Maximum Residential Scenario would be 32 tons per year of ROG, 20 tons per year of NO_x, 17 tons per year of PM_{10} and 5.2 tons per year of $PM_{2.5}$. Uncontrolled daily emissions of criteria air pollutants during operation of the Maximum Residential Scenario would be 171 pounds per day of ROG, 111 pounds per day of NO_x, 90 pounds per day of PM_{10} and 29 pounds per day of $PM_{2.5}$.

- **Full Build-Out Emissions of the Maximum Commercial Scenario:** Uncontrolled annual emissions of criteria air pollutants during operation of the Proposed Project after completion of all five phases of the Maximum Commercial Scenario would be 32 tons per year of ROG, 21 tons per year of NO_x, 18 tons per year of PM_{10} and 5.8 tons per year of $PM_{2.5}$. Uncontrolled daily emissions of criteria air pollutants during operation of the Maximum Commercial Scenario would be 180 pounds per day of ROG, 115 pounds per day of NO_x, 99 pounds per day of PM_{10} and 31 pounds per day of $PM_{2.5}$.

- Carbon monoxide (CO) emissions from project-generated vehicle trips are not anticipated to result in regional non-attainment or localized health risks.

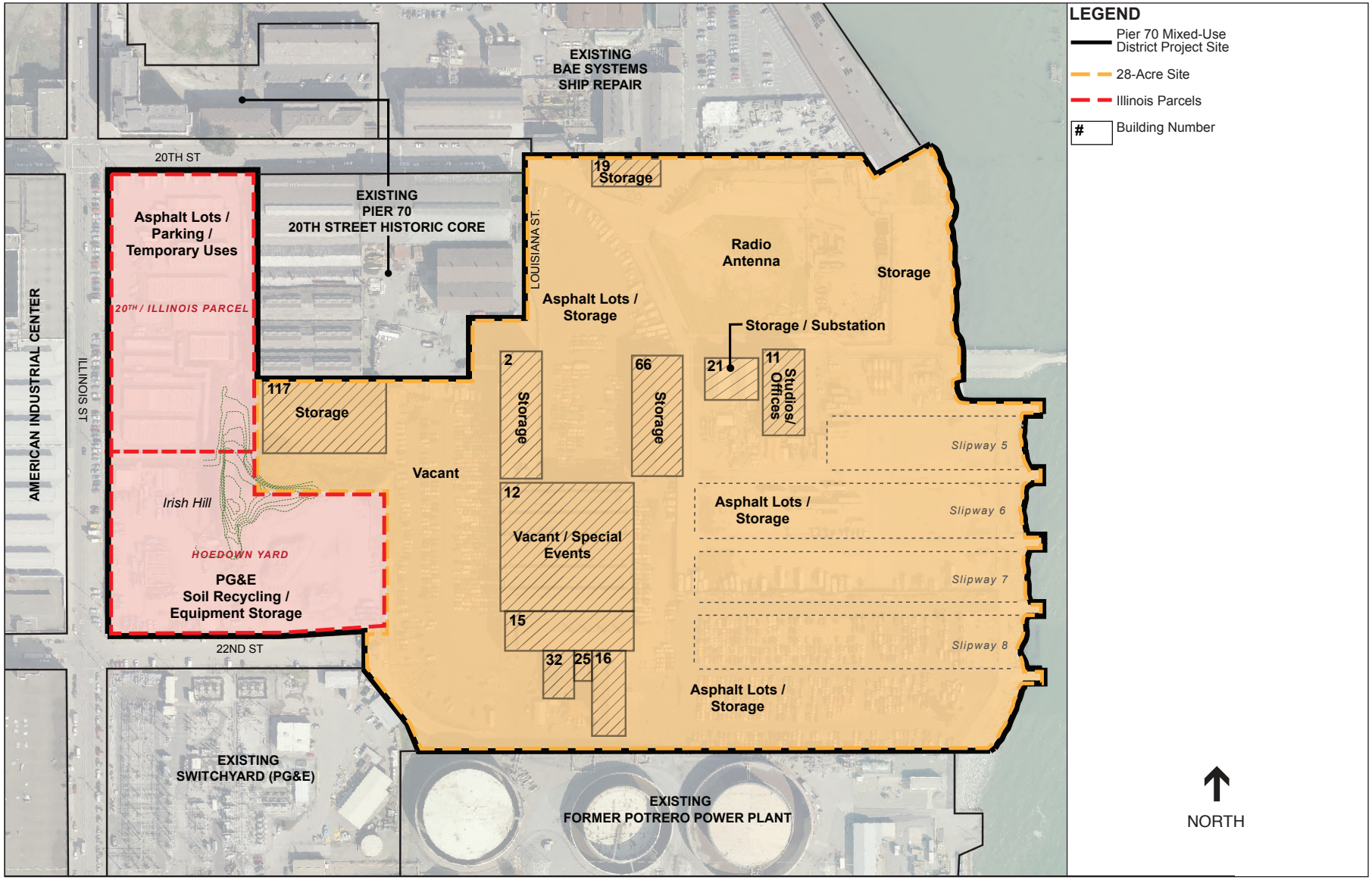
- Cumulative increased cancer risks for off-site receptors would be less than 100 in one million under the uncontrolled scenario but would exceed 100 in one million for the maximally exposed on-site receptor. Cumulative increased cancer risks for all receptors (inclusive of on-site and off-site receptors) would be less than 100 in one million under the controlled scenario.

- Emissions from construction equipment and trucks to construct the Proposed Project in addition to operations of earlier project phases would not expose on-site or off-site sensitive receptors to substantial $PM_{2.5}$ concentrations of 10 µg/m3 or greater. Operational mobile and stationary sources of emissions from the Proposed Project would not expose sensitive receptors to PM2.5 concentrations of 10 µg/m3 or greater.

II. Understanding of the Proposed Project

Project Location

The proposed Pier 70 Mixed-Use District project site is an approximately 35-acre area bounded by Illinois Street to the west, 20th Street to the north, San Francisco Bay to the east, and 22nd Street to the south. The majority of the project site is located within the Pier 70 area (Pier 70), which is owned by the City and County of San Francisco through the Port of San Francisco (Port). Two development areas constitute the project site. The "28-Acre Site" is an approximately 28-acre site located between 20th Street, Michigan Street, 22nd Street, and San Francisco Bay, and the "Illinois Parcels" form an approximately 7-acre site that consists of an approximately 3.4-acre Port-owned parcel, called the 20th/Illinois Parcel, along Illinois Street at 20th Street and an approximately 3.6-acre parcel, called the Hoedown Yard, at Illinois and 22nd streets, which is owned by PG&E; the Hoedown Yard includes a 0.2-acre portion of street right-of-way that bisects the site, and is owned by the City. **Figure 1**, **Existing Site Plan**, shows the existing project site and land uses.



SOURCE: Sitelab Studio, Turnstone Consulting/SWCA, 2015

Case No. 2014-001272SHD: Pier 70 Mixed Use District Project Air Quality Technical Report . 130688

Figure 1
Existing Site Plan

The Pier 70 Mixed-Use development site currently contains deteriorating and mostly vacant buildings. Current uses at the Project site include, but are not limited to, a self-storage facility, warehousing and storage facilities, automobile storage, dirt recycling facility, and artists' studio space in a structure known as the Noonan Building.

The 28-Acre Site has eleven existing structures some of which are historic resources.

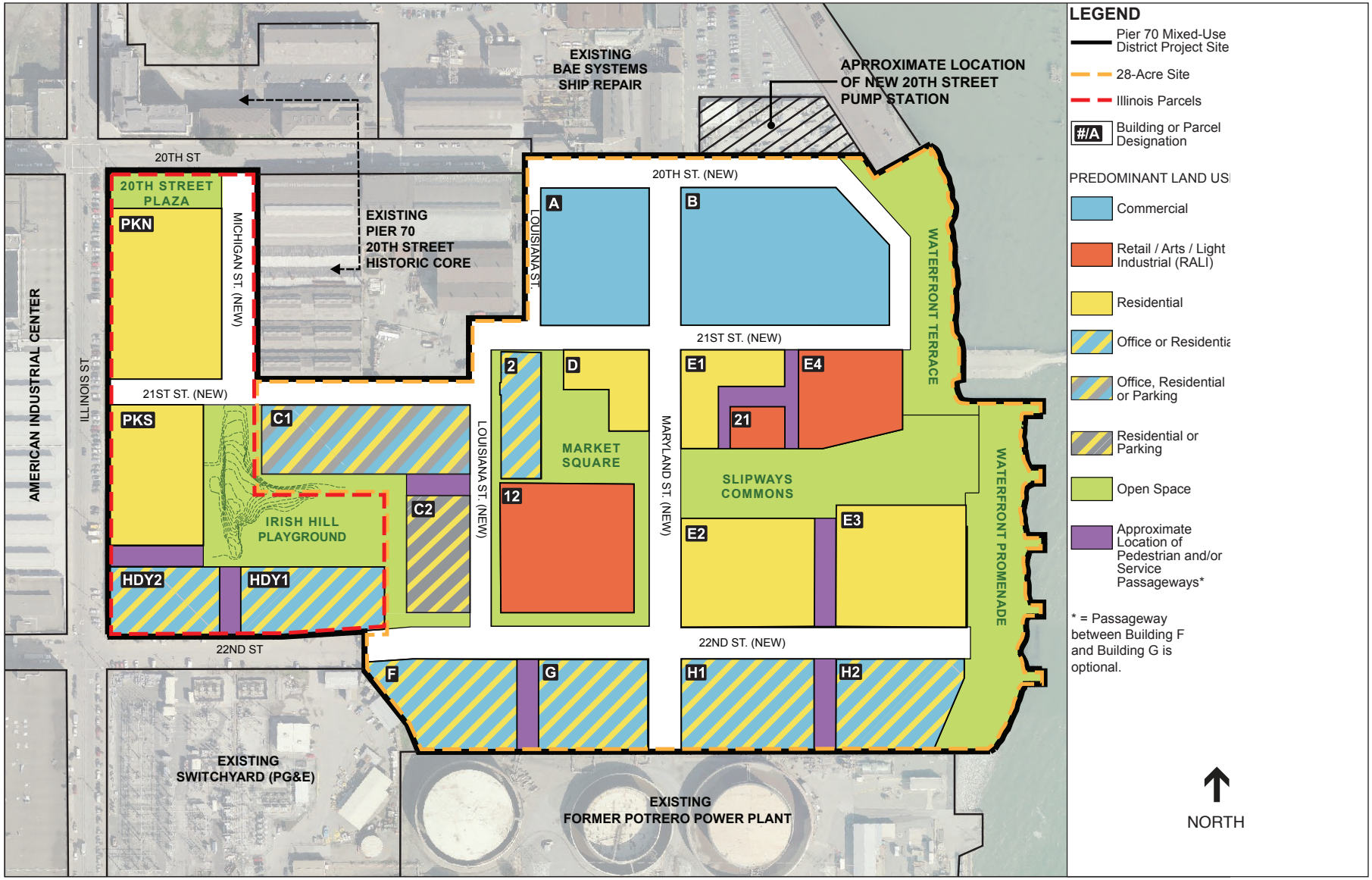
Project Description

The Proposed Project would include amendments to the General Plan and Planning Code, adding a new Pier 70 Special Use District, which would establish land use controls for the project site and incorporate the design standards and guidelines in the proposed *Pier 70 SUD Design for Development* document. As envisioned, the proposed Pier 70 Mixed-Use District Project (Proposed Project) would include market-rate and affordable residential uses, commercial use, retail, arts, light-industrial (RALI) uses,[1] parking, shoreline improvements, infrastructure development and street improvements, and public open space.

The proposed Pier 70 Mixed-Use Development project would include demolition of eight existing buildings, and construction of replacement and new housing, office and retail uses, new infrastructure, open space and community amenities. Under the provisions of the proposed Pier 70 Special Use District, the Proposed Project would provide a flexible land use program shown in **Figure 2**, Proposed SUD Flexible Land Use Program, as is common in other mixed-use areas of San Francisco, under which certain parcels could be developed for primarily commercial uses or residential uses. To cover a full range of potential land uses that could be developed under the Proposed Project, the EIR analyzes a maximum residential-use scenario ("Maximum Residential Scenario") and a maximum commercial-use scenario ("Maximum Commercial Scenario") for the project site, which will bracket specific maximum ranges of uses that could be developed.

For the 28-Acre Site, up to a maximum of approximately 3,442,265 gross square feet (GSF) of construction in new buildings and improvements to existing structures (excluding basement-level square footage allocated to accessory and district parking) could be constructed. Development of the Illinois Parcels would include up to a maximum of approximately 801,400 GSF in new buildings. Two parcels (C1 and C2) on the project site that would be designated for district structured parking could be developed with residential/commercial uses or residential use, depending on future market demand. Under both scenarios, Parcel C1 could be developed with residential, commercial, or parking uses and Parcel C2 could be developed with residential or parking uses. Active public rooftop open space (sports courts, play fields, urban agriculture plots, seating, and observational terrace areas) could be developed on the roof of both of these parcels under both scenarios as well, if the parcels are built as district parking structures.

[1] The project sponsors describe the RALI use as including neighborhood-serving retail, arts, eating and drinking places, production distribution and repair, light manufacturing, and entertainment establishments.



SOURCE: Sitelab Studio, Turnstone Consulting/SWCA, 2015

Figure 2
Proposed SUD Flexible Land Use Program

The Maximum Residential Scenario and the Maximum Commercial Scenario for both the 28-Acre Site and the Illinois Parcels are mutually exclusive: the maximum commercial and maximum residential programs could not both be built. If the Proposed Project were to be built with the maximum amount of commercial space, less space would be developed with residential uses, and conversely, if the maximum number of residential units were constructed, less space would be developed with commercial uses as described below. Depending on the uses developed, the Proposed Project's total GSF would range between a maximum of 4,212,230 GSF, under the Maximum Residential Scenario, to 4,179,300 GSF, under the Maximum Commercial Scenario, excluding square footage associated with accessory and district parking. Total construction on the 28-Acre Site would not exceed a maximum of 3,422,265 GSF, and a maximum of 801,400 GSF on the Illinois Parcels.

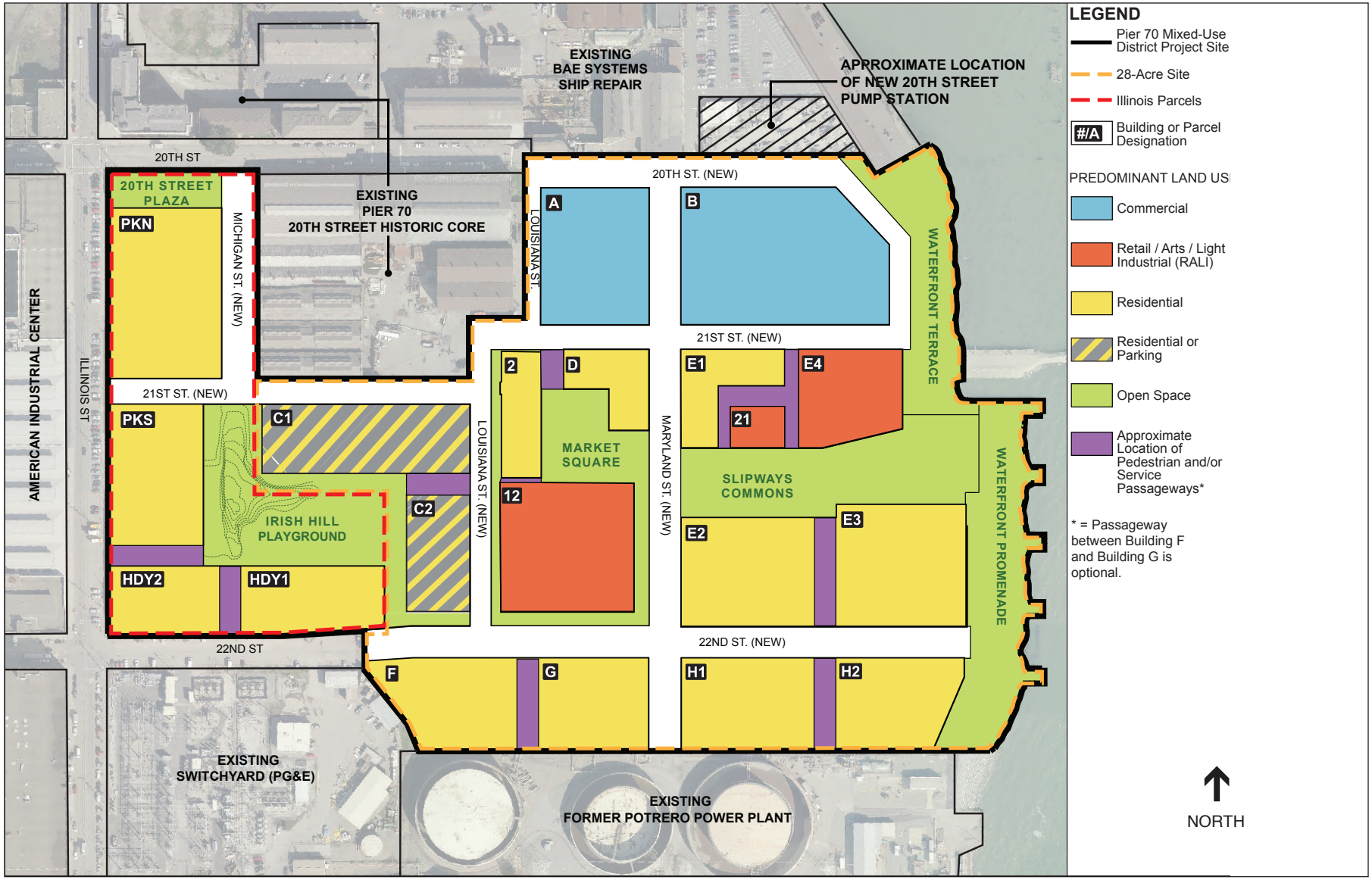
Figure 3 and **Figure 4** present the Specific Land Use Plans for the Maximum Residential and Maximum Commercial Scenarios, respectively.

Proposed infrastructure improvements associated with the Project include:

- Site preparation, including removal of contaminated soils, grading, soil compaction and stabilization, construction and installation of water, sanitary sewer, storm drainage, and other utility infrastructure, and subsurface improvements to mitigate seismic conditions.
- Improvements to raise the grade of the 28-Acre Site to protect against projected future sea level rise.
- Seismic reinforcement of historic buildings to be retained and reused, meeting the Secretary of Interior's Standards.
- Construction of new streets and walkways, and improvement of existing streets to be retained.
- Construction of shoreline improvements above the mean high water line, public access, and parks.

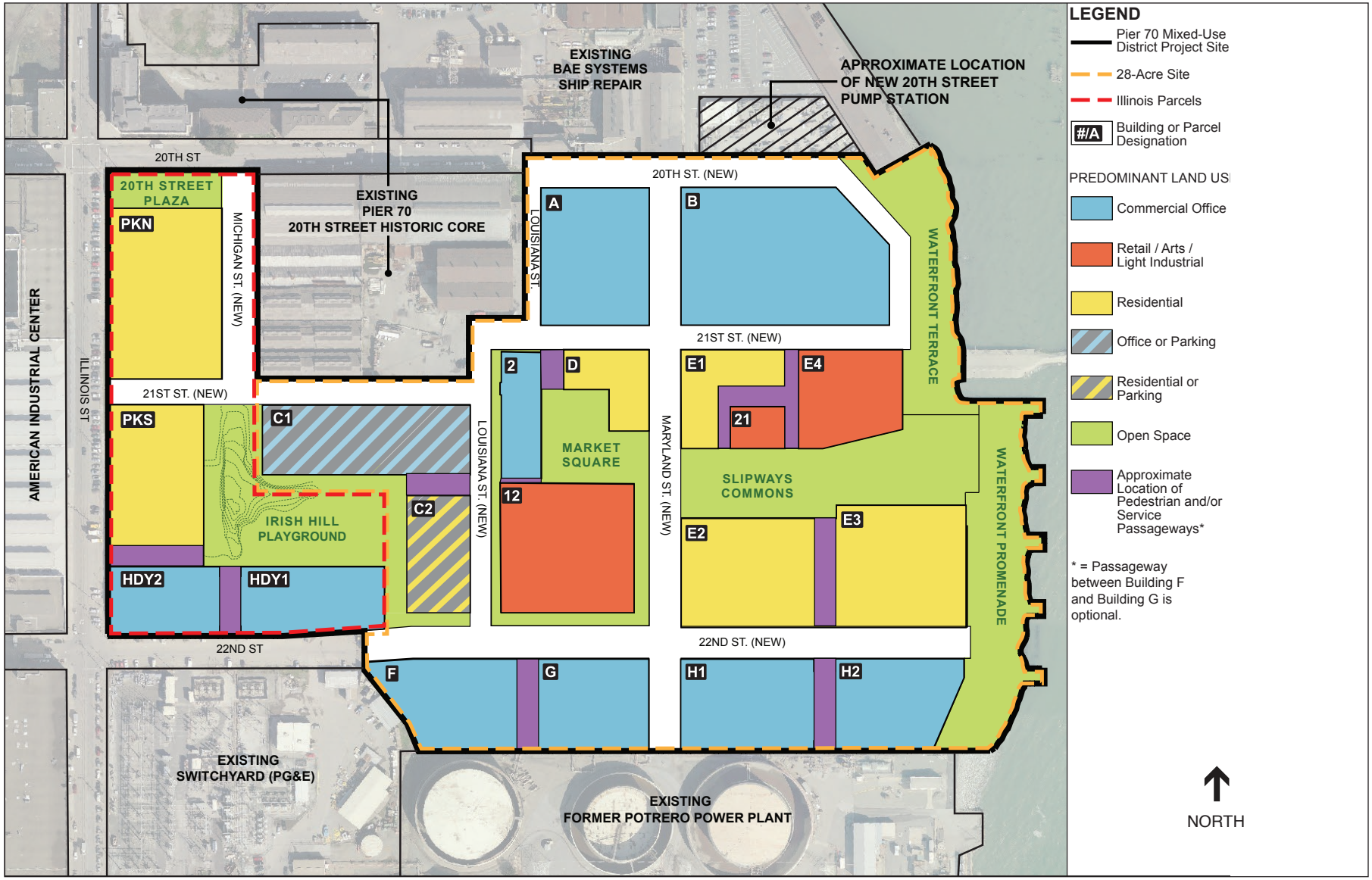
The specific number of buildings to be constructed has not yet been determined at the current point of project development under the project. Rather, two scenarios of development based on number of dwelling units, square feet of non-residential use and building height limits, are analyzed to provide "bookends" for the analysis of environmental impacts. **Table 1** presents the number of dwelling units and square feet of non-residential use envisioned under each development scenario.

The 28-Acre Site has eleven existing structures some of which are historic resources. Buildings 2 and 12 would remain in their current locations, and Building 21 would be relocated about 75 feet to the southeast. The eight remaining buildings on this site would be demolished as part of the Proposed Project.



SOURCE: Sitelab Studio, Turnstone Consulting/SWCA, 2015

Figure 3
Land Use Plan for the Maximum Residential Scenario



SOURCE: Sitelab Studio, Turnstone Consulting/SWCA, 2015

Figure 4
Land Use Plan for the Maximum Commercial Scenario

TABLE 1
DEVELOPMENT SCENARIOS FOR PIER 70 MIXED USE DEVELOPMENT

28-Acre Site Maximum Residential Scenario		
Residential	2,150	Units
Commercial - Office	1,095,650	GSF
Innovation, Retail and Arts	445,180	GSF
28-Acre Site Maximum Commercial Scenario		
Residential	1,100	Units
Commercial - Office	2,024,050	GSF
Innovation, Retail and Arts	441,215	GSF
Illinois Parcels - Maximum Residential Scenario		
Residential	875	Units
Commercial - Office	6,600	GSF
Innovation, Retail and Arts	34,800	GSF
Illinois Parcels - Maximum Commercial Scenario		
Residential	545	Units
Office	238,300	GSF
Innovation, Retail and Arts	45,735	GSF
Maximum Residential Scenario – Project Totals		
Residential	3,025	Units
Office	1,102,250	GSF
Innovation, Retail and Arts	479,980	GSF
Non-Residential Total	1,582,230	GSF
Maximum Commercial Scenario – Project Totals		
Residential	1,645	Units
Office	2,262,350	GSF
Innovation, Retail and Arts	486,950	GSF
Non-Residential Total	2,749,300	GSF

Construction Phasing

For both development scenarios, the Maximum Residential Scenario and the Maximum Commercial Scenario, Proposed Project construction is conceptual. However, construction is expected to begin in 2018 and would be phased over an approximately 11-year period, concluding in 2029. Proposed development is expected to involve five phases, are described generally by scenario below, but are subject to change.

Air Quality Concerns of the Proposed Project

The Proposed Project would introduce new sources of air emissions. The new residential uses would be sensitive receptors for the purposes of air quality analysis. This analysis quantifies the construction and operational criteria air pollutant emissions that would result from the Proposed Project. These include the ozone precursor's reactive organic gases (ROG) and oxides of nitrogen (NO_x), inhalable particulate matter less than 10 microns in diameter (PM_{10}) and fine particulate

matter less than 2.5 microns in diameter ($PM_{2.5}$). In addition, community risk and hazards due to construction and operational emissions of the separate class of pollutants categorized as toxic air contaminants (TACs), including organic gases and diesel particulate matter (DPM), are also analyzed and resultant excess cancer risk and localized concentrations of $PM_{2.5}$ are predicted.

Anticipated Construction-Related Sources

Construction equipment, construction-related vehicle trips, construction worker vehicle trips, and ground disturbing activities (e.g., excavation and grading) would generate direct emissions of toxic air contaminants, criteria air pollutants (*e.g.*, ROG, NO_x, PM_{10}, $PM_{2.5}$, and CO), and fugitive dust emissions. Diesel-fueled equipment would result in emissions of DPM, which is a TAC that is a primary concern because many toxic compounds adhere to diesel exhaust particles.

The project is anticipated to commence in January 2018 with construction occurring in five phases for each development scenario. **Table 2** shows the phasing schedule for the Maximum Residential Scenario while **Table 3** shows the phasing schedule for the Maximum Commercial Scenario.

Within each phase, individual buildings would be constructed incrementally, and the new dwellings would be occupied as each phase is completed. The project site is currently industrial or commercial, and there are no current residents of the project site.

During each phase, the existing buildings, streets, and utilities that are to be demolished would be demolished first, and rough grading of the streets, building pads and open space would occur. The construction of new underground utility infrastructure with appropriate tie-ins to existing utilities would follow, and then buildings would be constructed as determined by the financing available, as well as the best scenarios for facilitating equipment and material access to the building sites.

The project sponsors have provided illustrative information on estimated sequences of phase construction[2], however, project specific off-road equipment types are not known at this stage of project development. Consequently, the air quality analysis used default off-road equipment types represented in the CalEEMod model[3] as assumptions for each phase. The CalEEMod model uses data from a South Coast Air Quality Management District construction survey to estimate default equipment lists based on total project acreage as calculated from the acreage associated with a given construction project. The CalEEMod model has no equipment assumptions associated with trenching/ utilities phase. Consequently equipment estimates for the utilities installation phase were taken from the URBEMIS2007 model User's Guide, Appendix H which provides equipment assumptions for trenching phases of less than 90 acres. The assumed off-road equipment inventory for a representative phase is presented in **Table 4** below.

2 Forest City Enterprises, Data Request #2 response from Kelly Pretzer submitted to Turnstone Consulting via e-mail May 19, 2015.

3 On August 5, 2013 BAAQMD notified the public via its website that all future CEQA analysis of criteria pollutant emissions should be conducted using CalEEMod. However, this notification is no longer posted at this time.

TABLE 2
PROJECT CONSTRUCTION AND REHABILITATION PHASING
FOR THE MAXIMUM RESIDENTIAL SCENARIO

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (GSF/No. of Residential Units)	Commercial (GSF)	RALI (GSF)		
Phase 1 (2018-2019)	*28-Acre Site*						
	Illinois Parcels	PKN	261,700 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new), 20th Street Pump Station (new)
Phase 2 (2018-2020)	*28-Acre Site*	Building 2*, Parcel C1, Parcel C2, Parcel D, Parcel E2	578,250 / 662 units	221,100	52,035	Building 12 Market Plaza Market Square Slipway Commons (western portion)	20th Street (new/central portion) 21st Street (new/eastern portion) 22nd Street (existing and new) Louisiana Street (new/southern portion) Maryland Street (new/northern portion)
		Building 12*		60,000	105,500		
	Illinois Parcels						
Phase 3 (2021-2023)	*28-Acre Site*	Parcel A, Parcel F, Parcel G	436,100 / 505 units	288,200	57,270	Irish Hill Playground	Maryland Street (new/southern portion [continued from Phase 2]) and Louisiana Street (new/northern portion) [continued from Phase 2]
	Illinois Parcels	PKS	213,100 / 240 units		11,000		
Phase 4 (2024-2026)	*28-Acre Site*	Parcel E1, Parcel E3, Parcel E4, Parcel B	378,600 / 436 units	526,350	189,675	Slipway Commons (eastern portion [continued from Phase 3]) Waterfront Terrace Waterfront Promenade (northern portion)	20th Street (western and eastern portions [continued from Phase 2]) 21st Street (eastern portion [continued from Phase 2]) 22nd Street (eastern portion [continued from Phase 2])
		Building 21*			10,200		
	Illinois Parcels	Parcel HDY1, Parcel HDY2	285,200 / 335 units		17,200		
Phase 5 (2027-2029)	*28-Acre Site*	Parcel H1, Parcel H2	477,050 / 547 units		40,700	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
Total			**2,630,000 / 3,025 units**	**1,102,250**	**479,980**		

NOTES: * = denotes an existing building that would be rehabilitated under the Proposed Project.

SOURCE: Forest City; Turnstone/SWCA

TABLE 3
PROJECT CONSTRUCTION AND REHABILITATION PHASING
FOR THE MAXIMUM COMMERCIAL SCENARIO

Phase	Project Site	Parcel or Building	Proposed Construction and Rehabilitation			Open Space	Roadways and Other Improvements
			Residential (GSF/No. of Residential Units)	Commercial (GSF)	RALI (GSF)		
Phase 1 (2018-2019)	*28-Acre Site*						
	Illinois Parcels	PKN	260,500 / 300 units	6,600	6,600	20th Street Plaza	Michigan Street (new), 20th Street Pump Station (new)
Phase 2 (2018-2020)	*28-Acre Site*	Parcel A, Parcel D, Parcel E2, Building 2*	389,400 / 445 units	348,200	97,400	Building 12 Market Plaza Market Square Slipway Commons (western portion)	20th Street (new/central portion) 22nd Street (existing and new) Maryland Street (new/northern portions)
		Building 12*			52,720		
	Illinois Parcels	PKS	215,500 / 245 units		11,000		
Phase 3 (2021-2023)	*28-Acre Site*	Parcel C2, Parcel E1, Parcel F, Parcel G	325,350 / 375 units	442,200	57,620	Irish Hill Playground	21st Street (new/eastern portion) Louisiana Street (new) Maryland Street (new/southern portion [continued from Phase 2]) and Louisiana Street (new/northern portion) [continued from Phase 2]
	Illinois Parcels	Parcel HDY1, Parcel HDY2		231,700	28,135		
Phase 4 (2024-2026)	*28-Acre Site*	Parcel B, Parcel C1, Parcel E3,	242,250 / 280 units	747,450	85,505	Slipway Commons (eastern portion [continued from Phase 2]) Waterfront Terrace Waterfront Promenade (northern portion)	20th Street (western and eastern portions [continued from Phase 2]) 21st Street (western portion [continued from Phase 3]) 22nd Street (eastern portion [continued from Phase 2])
		Building 21*, Parcel E4			110,400		
	Illinois Parcels						
Phase 5 (2027-2029)	*28-Acre Site*	Parcel H1, Parcel H2		486,200	37,570	Waterfront Promenade (southern portion [continued from Phase 4])	
	Illinois Parcels						
Total			**1,433,000 / 1,645 units**	**2,262,350**	**486,950**		

NOTES: * = denotes an existing building that would be rehabilitated under the Proposed Project.

SOURCE: Forest City; Turnstone/SWCA

TABLE 4
OFF-ROAD CONSTRUCTION EQUIPMENT ASSUMED
FOR EACH PHASE OF CONSTRUCTION ACTIVITY

Construction Activity	Construction Equipment	Quantity	Horsepower
Demolition	Excavators	3	162
	Dozer	2	255
	Concrete Saws	1	81
Site Preparation	Dozer	3	255
	Loader/backhoe	4	97
Grading	Motor Grader	1	174
	Dozer	1	255
	Loader/backhoe	3	97
	Excavators	1	162
Drainage/Utilities/Subgrade	Boom Truck	1	87
	Loader/backhoe	1	97
	Excavators	2	162
Building Construction	Forklift	3	89
	Crane	1	226
	Welder	1	46
	Generator	1	84
	Loader/backhoe	3	97
Paving	Paver	1	125
	Rollers	2	80
	Paving Equipment	2	130
	Loader/backhoe	1	97
	Cement and mortar mixers	2	9
Architectural Coating	Air Compressor	1	78

SOURCES: CAPCOA, *CalEEMod, Appendix E Technical Source Documentation*, Revised 2013 and *URBEMIS User's Manual Appendix H*, 2007 for Drainage/Utilities/Subgrade phase.

On-road haul truck traffic would be dominated by material delivery to the site and removal of demolition and excavation materials. Approximately 325,000 cubic yards (CY) of soil would be hauled away from the entire site for all five phases of construction, resulting in a maximum of 80 round trips per day (160 one-way trips), including both soil off-haul and demolition spoils. There would be additional trucks required for concrete delivery, plus vendor trips.

Anticipated Operational Sources

Operational emissions from the Proposed Project would result from the following sources:

Diesel emissions may be generated during project operations by emergency standby diesel generators required by the San Francisco Building Code for buildings with occupied floor levels greater than 75 feet in height. There are 11 parcels (all in the 28-acre site) that would allow building heights of up to 90 feet. It is conservatively assumed that each of these 11 parcels would have an emergency standby diesel generator and that such generators would have an average size

of 400 horsepower (hp).[4] Emissions from standby generators were calculated using emission factors published by CARB and USEPA describing the Off-Road Compression-Ignition (Diesel) Engine Standards.[5] These were added to CalEEMod emissions for vehicles, area sources and natural gas combustion. Emissions rate(s) for the potentially required emergency standby diesel generators were taken from the federal Tier 2 diesel engine standards with a rating between 75 and 750 hp, although manufacture of such engines ceased in 2007 pursuant to USEPA regulations for emergency standby diesel, some of these units are still available on the market. The generators are conservatively assumed to vent at the ground level.

Any required emergency standby diesel generator engines would likely be limited to 50 hours per year of non-emergency use because of Airborne Toxic Control Measure (ATCM) requirements[6], and would be subject to BAAQMD limits and best available control technology (BACT) requirements.[7] The rating of standby generators is assumed to be approximately 400 hp. These proposed air pollutant sources would be subject to certain limits, including an emission limit of 0.15 g/hp-hr (0.493 lb/hr) for $PM_{2.5}$ or DPM and an operation limit of no more than 50 hours per year (0.0675 lb per average day) for non-emergency purposes, as required by state regulations (ATCM for Stationary CI Engines – Emergency Standby Diesel-Fueled CI Engine). Other operational emissions include the following:

- Net new motor vehicle trips generated by the intensification of residential and other uses of the site. The Transportation Impact Study estimates that the Maximum Residential Scenario of the project would generate approximately 31,016 Project vehicle trips per day, while the Maximum Commercial Scenario would generate approximately 34,790 Project vehicle trips per day;

- Natural gas combustion for space (boilers) and water heating as well as cooking for both residential and commercial land uses. Natural gas combustion is estimated by the CalEEMod model. The model uses information from the California Commercial End Use Survey database to develop natural gas usage per square feet per year for non-residential buildings. Natural gas use from residential land uses is calculated based on the Residential Appliance Saturation Survey which is a comprehensive energy use assessment that includes the energy end use for various climate zones in California; and

- Area sources including, gas-fire fireplaces and operation of landscape maintenance equipment, emissions from use of commercial products resulting from an increase in population density, and maintenance application of architectural coatings (paint).

4 The 400 hp average estimate is based on a review of BAAQMD permit evaluations for the past 2 years for residential or office buildings of 8 stories or less.

5 CARB. Table 1: ARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standards. Available at www.arb.ca.gov/msprog/ordiesel/documents/Off-Road_Diesel_Stds.xls. Accessed January, 2016.

6 The Air Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) Engines is set forth in sections 93115 through 93115.15, title 17, California Code of Regulations.

7 BAAQMD District Regulation 2, Rule 5, Section 201 defines Best Available Control Technology for Toxics.

The dominant operation-related emission sources for land use development projects are typically the vehicle trips generated by residents and workers. The magnitude of this mobile source activity is predicted for the Proposed Project in a separate Transportation Impact Study.[8]

The only new project-related stationary emission sources likely to require pre-construction permits from the BAAQMD would be any required emergency standby diesel generator engines (discussed above). The required permits would be applied for and issued after the conclusion of the CEQA process.

III. Air Quality Setting

The project site is located along San Francisco's Central Waterfront just west of Potrero Hill in San Francisco. Highways 101 and 280, the Potrero Hill neighborhood and the Dogpatch neighborhood are in the western vicinity of the project. The American Industrial Center, a large multi-tenant commercial building, is located across Illinois Street, west of the Illinois Parcels. To the north of the project site are the BAE Systems shipyards, the 20th Street Historic Core of the Union Iron Works Historic District (Historic Core), the future Crane Cove Park (construction to begin in 2016), and the Mission Bay South redevelopment area. To the south of the project site are PG&E's Potrero Substation (a functioning high-voltage transmission substation serving San Francisco), the decommissioned Potrero Power Plant, and the TransBay Cable converter station, which connects the Pittsburg-San Francisco 400 megawatt direct-current, underwater electric transmission cable to the City's electricity transmission grid by way of the Potrero Substation.

Existing Sources

The BAAQMD recommends investigating a 1,000-foot radius (termed the "zone of influence") around a project property boundary for assessing the individual and cumulative health risk and hazard effects of nearby sources.[9] Existing health risks for the entire City have been inventoried from data developed by the City in cooperation with the BAAQMD, which includes stationary sources within 1,000 meters of the sensitive receptors, along with mobile source emissions generated by vehicles on I-280 and other major arterials as well as Caltrain operations and this data is used to establish existing health risks and for the analysis of cumulative health risks. The methodology and technical documentation for modeling citywide air pollution and associated health risk is available in the document entitled, *The San Francisco Community Risk Reduction Plan: Technical Support Documentation* (SF-CRRP)[10]. The health risk assessment analysis contained herein updated the Citywide CRRP model to reflect refined locations of stationary sources, as discussed below, as well as to update cancer risk values based on the latest (2015) guidance by the State Office of Environmental Health Hazard Assessment (OEHHA) which are pending adoption by BAAQMD in December of 2016.

8 Fehr and Peers, *Transportation Impact Study, Pier 70 Mixed- Use District Project*, *December, 2016*, page 168.

9 Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, Updated May 2011, page 5-2.

10 Bay Area Air Quality Management District, San Francisco Department of Public Health, and San Francisco Planning Department, *The San Francisco Community Risk Reduction Plan: Technical Support Documentation*, December 2012. A copy of this document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2014.001272ENV.

The project site is located within an area designated as an Air Pollutant Exposure Zone (APEZ) by the San Francisco Department of Public Health because modeled health risks or PM2.5 concentrations in the area already exceed the cumulative exposure thresholds of the City (100 in one million excess cancer risk or 10 ug/m3, respectively.). This designation appears to be a result of the sand blasting operations of the nearby BAE Systems shipyard, which adjoins the Project site on the north, across 20th Street. Review of city-wide modeling data indicated that the emissions from the BAE Systems sources were incorrectly located and, as a consequence, Ramboll/ENVIRON worked with BAAQMD to more accurately locate these emissions within the City-wide model. Revised modeling was conducted to reassess cancer risk and $PM_{2.5}$ concentrations within the project area and its environs. This updated modeling demonstrated that the proposed Project site does not meet the criteria for being within an APEZ at this location, meaning that the existing excess cancer risk is below 100 per one million and PM2.5 concentrations are below 10 ug/m3. Background cancer risk values on the project site are between 21 and 44 in a million, with background values ranging from 0 to 265 in a million within 1,000 meters of the site (from the updated CRRP model with incorporation of updated OEHHA guidelines). Background $PM_{2.5}$ concentrations range from 8.3 to 8.8 $\mu g/m^3$ on the project site, with background values varying between 0 and 11 $\mu g/m^3$ within 1,000 meters of the site.

BAAQMD guidance indicates that roadways with volumes exceeding 10,000 average annual daily traffic (AADT) should be considered with regard to their potential impact on new sensitive receptors and all such roadway sources, which include Third Street, are included in the City's CRRP model citywide.

There are approximately 40 stationary sources in the zone of influence around the Proposed Project as identified in the latest (2012) Google Earth application inventory from the BAAQMD[11], however some of these sources are no longer operational (e.g., Potrero Power Plant and the CEMEX Materials concrete plant, which were removed from the City's CRRP model as part of this analysis). Emissions from both surrounding traffic and nearby stationary sources are included in the citywide air pollution model discussed above.

Sensitive Receptors

Receptors evaluated in this analysis include a representative sample of known residents (child and adult) both in the surrounding neighborhood, and other sensitive receptors (e.g., school children, hospital/nursing home patients, etc.) located in the surrounding community and along the expected travel routes of the on-road delivery and haul trucks. Existing sensitive receptors in the project vicinity (within 1,800 feet of the project site) are listed below in **Table 5**. However the health risk impact analysis also includes receptor locations on a 20 meter by 20 meter receptor grid out to 1,000 meters of the project site, consistent with the citywide CRRP modeling. In addition to the residential receptors, ESA identified six schools within 1,000 meters of the Project site, including: Rise

[11] Bay Area Air Quality Management District. *Highway Screening Analysis Tool*. April 2011. http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines

TABLE 5
SENSITIVE RECEPTORS IN THE PROJECT VICINITY

Type of Sensitive Receptor	Address	Minimum Distance from Site
EXISTING SENSITIVE RECEPTORS WITHIN 900 FEET OF PROJECT SITE		
North of 20th Street (Northwest of Project Site)		
Dogpatch Alternative School (Site 2)	616 20th Street	140 feet
Residential	628 20th Street	190 feet
Potrero Kids (Daycare)	810 Illinois Street	350 feet
Residential	820 Illinois Street	200 feet
Residential	2235 Third Street	375 feet
Residential	993 Tennessee Street	460 feet (approx.)
La Piccola Scuola Italiana (School)	728 20th Street	470 feet (approx.)
Residential	700 Illinois Street	770 feet
Residential	755 Tennessee Street	825 feet
Residential	701 Minnesota Street	700 feet
Between 20th and 22nd Streets (West of Project Site)		
Dogpatch Alternative School	2265 Third Street	250 feet
Residential	2476-2478 Third Street	370 feet
Residential	702-718 22nd Street	375-430 feet
Residential	1080 Tennessee Street	630 feet
Friends of Potrero Hill Nursery School	1060A Tennessee Street	630 feet
Residential	808-840 22nd Street	690-780 feet
Residential	801-976 Minnesota Street	650-915 feet
South of 22nd Street (Southwest of Project Site)		
Residential	711 22nd Street	380 feet
Residential	1100-1195 Tennessee Street	500 feet
Residential	825-829 22nd Street	700 feet
Residential	1015 Minnesota Street	750 feet
FUTURE/PLANNED RESIDENTIAL RECEPTORS WITHIN 900 FEET OF PROJECT SITE		
North of 20th Street (North or Northwest of Project Site)		
Residential (Mixed)	815 Tennessee Street	525 feet
Residential (Mixed)	2177 Third Street	700 feet
Residential (Mixed)	888 Tennessee Street	650 feet
South of 22nd Street (Southwest of Project Site)		
Residential (Mixed)	1201-1225 Tennessee Street	780 feet

SOURCE: Google Earth (Imagery Date 5/11/2015) for parcel data (land use, address, and distance to the site); SWCA, Baseline and Cumulative Projects List, September 10, 2015

Institute, Irving M. Scott School, Daniel Webster Elementary, La Picola Scuola Italiana, Live Oak School, and Potrero Terrace Nursery School. A receptor grid was developed as a 10 meter by 10 meter grid for future onsite receptors and offsite receptors within 25 feet of the project site. Beyond 25 feet and up to 1,000 meters of the project site the receptor grid was aligned to match

the receptor locations identified in the Citywide CRRP modeling (on a 20 x 20 meter grid). This receptor grid is presented as the first figure in Appendix B.

IV. Criteria Air Pollutants

Methodology for Criteria Air Pollutant Analysis

Construction Emissions

Project construction-related emissions were estimated using (1) the CalEEMod emissions estimator model (version 2013.2.2), which included default equipment mix estimated by the model for each construction subphase and (2) emission factors from the California Air Resources Board (CARB)[12]. The project sponsors provided illustrative information on construction phase timing.[13] Activity for on-road construction worker trips and vendor truck trips were estimated using model default estimates. Haul truck activity for both demolition debris and soil excavations were provided by the applicant.[14]

Both the U.S. EPA and CARB have developed standards for off-road construction equipment. The first federal standards (Tier 1) for new construction equipment over 50 horsepower with off-road diesel engines were adopted in 1994, to be phased-in from 1996 to 2000. In 1998, the EPA signed the regulation that introduced Tier 1 standards for equipment under 50 horsepower and increasingly more stringent Tier 2 and Tier 3 standards for all equipment with phase-in schedules from 2000 to 2008. Tier 3 standards for NOx and ROG are similar in stringency to the 2004 standards for highway engines, however Tier 3 standards for PM were not adopted at this time. On May 11, 2004, EPA adopted the final rule introducing Tier 4 emission standards, which were phased-in over the period of 2008-2015. The Tier 4 standards require that emissions of PM and NOx be further reduced by about 90%. The current (2014) off-road equipment fleet in California consists of approximately 21%Tier 0 (uncontrolled) engines, 20% Tier 1 engines, 25% Tier 2 engines, 12 % Tier 3 engines and 22% Tier 4 engines[15].

Construction-related emissions were calculated in CalEEMod assuming county-wide engine Tier ratings predicted for off-road equipment for each construction year analyzed beginning with year 2018 for Phases 1 and 2.

Operational Emissions

Default vehicle trip rates of the CalEEMod were refined to reflect the project-specific trip generation as determined in the Transportation Analysis.[16] These trip generation rates have been adjusted to account for internal and external trip generation. Pass-by trips were reported to be a

12 Specifically, CARB's OFFROAD2007 model and the 2011 Inventory Model for the In-use Off-road Equipment Rule.
13 Forest City Enterprises, Data Request #2 response from Kelly Pretzer submitted to Turnstone Consulting via e-mail May 19, 2015.
14 Ibid.
15 San Francisco Department of the Environment et.al., *San Francisco Clean Construction Ordinance Implementation Guide for San Francisco Public Projects*, Final August 2015, page 6. Available online at https://www.sfdph.org/dph/EH/Air/CleanConstruction.asp. Accessed February 4, 2016.
16 Fehr & Peers, *Transportation Impact Study, Pier 70 Mixed- Use District Project*, (December, 2016), page 168.

negligible component of the overall trip generation[17] and all trips in the CalEEMod analysis were assumed to be primary. Default vehicle trip lengths from CalEEMod, which were developed with input from the BAAQMD, were used to determine the increase in vehicle miles travelled from the Proposed Project. CalEEMod default emission factors for motor vehicle trips are from EMFAC2011 which is no longer the most recent EPA-approved model. Consequently, emission factors and vehicle fleet percentages from EMFAC2014, which was approved by U.S. EPA in December of 2015, were inserted into the CalEEMod input files for each operational analysis year. Operational emission calculations for entrained road dust employed San Francisco-specific silt loadings[18]

The analysis calculates emissions of reactive organic gases (ROG) from maintenance applications of architectural coatings (i.e., paint) assuming that these coatings would meet BAAQMD standards for volatile organic compounds (VOC) content limits (Regulation 8, Rule 3). A San Francisco County-specific consumer product emission factor was used in CalEEMod to estimate daily ROG emissions from the use of consumer product by future occupants of the proposed development.

Potential emissions from 11 emergency standby diesel generators (stationary sources) were estimated based on the assumption that they would meet CARB Tier 2 emission standards, conservatively assuming that each parcel with designated building height limits in excess of 70 feet would require such equipment. At this point in time, the project applicant does not have specifications for potential generators. In order to estimate emissions associated with the generators, it was assumed that proposed generators would meet the state Tier 2 diesel engine standards for particulate matter required for diesel engines with a rating of 400 hp.

Finally, Proposed Project operational emissions of criteria pollutants from vehicle, stationary (standby generators), building heating and cooling, and area sources are summed. Potential localized carbon monoxide concentrations impacts were assessed using BAAQMD screening criteria[19].

Results of the Criteria Pollutant Analysis

Demolition, excavation, foundation installation and erection of structures are all construction activities that would temporarily affect local air quality during the anticipated 5-Phase construction schedule. These activities would cause temporary increases in particulate matter (including fugitive dust) and other pollutant emissions. Construction dust includes PM_{10} and $PM_{2.5}$, primarily from "fugitive" sources; use of construction equipment and worker vehicles results in combustion-related emissions of criteria air pollutants (ROG, NO_x, PM_{10}, and $PM_{2.5}$); and evaporative emissions (ROG emissions) occur during application of architectural coatings for interior and exterior finishes. The following discussion addresses fugitive dust and construction criteria air pollutant emissions.

[17] Adavant Consulting, Jose Farran, e-mail communication to Andy Kosinski of Fehr & Peers Consulting, May 9, 2016.
[18] CARB, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust, Revised April 2014.
[19] Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2011, page 3-3.

Fugitive Dust

The San Francisco Health Code Article 22B and San Francisco Building Code Section 106A.3.2.6 collectively constitute San Francisco's Construction Dust Control Ordinance (adopted in July 2008). The Construction Dust Control Ordinance requires that all site preparation work, demolition, or other construction activities within San Francisco that have the potential to create dust or to expose or disturb more than 10 cubic yards or 500 square feet of soil comply with specific dust control measures whether or not the activity requires a permit from the Department of Building Inspection (DBI). For projects over one-half acre, the Construction Dust Control Ordinance requires that project sponsors submit a Dust Control Plan for approval by the San Francisco Department of Public Health (DPH) prior to issuance of a building permit by the DBI.

The Construction Dust Control Ordinance has a mandate for "no visible dust." The ordinance requires project sponsors and contractors responsible for construction activities to control construction dust on the site using a menu of specified procedures or implement other practices acceptable to the Director of Public Health that result in equivalent dust control. Dust suppression activities, referred to as best management practices or BMPs, may include watering all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code. Section 1247 of Article 22B requires that all City Agencies that authorize construction or other improvements on City property adopt rules and regulations to ensure that the dust control requirements identified in Article 22B are followed. The BMPs employed in compliance with the City's Construction Dust Control Ordinance provide an effective strategy for controlling fugitive dust and satisfy BAAQMD's recommendation to implement BMPs to control fugitive dust. Therefore, particulate matter emissions from fugitive dust are not quantified in this report.

Construction Period Emissions

Sources of Construction Emissions

Demolition, excavation, foundation installation and erecting the proposed structures all involve construction activities that would temporarily affect local air quality during the anticipated 5-Phase construction schedule. Use of construction equipment and worker vehicles results in combustion-related emissions of criteria air pollutants (ROG, NO_x, PM_{10}, and $PM_{2.5}$); and evaporative emissions (ROG) occur during application of architectural coatings for interior and exterior finishes.

Each of the major categories of construction emissions sources were calculated separately with the CalEEMod model. On-road vehicle trips include emissions from haul trucks for delivering construction material and removing debris and excavation spoils, use of water trucks to reduce dust, and worker commutes that may occur locally or elsewhere in the region. The assumed VOC content for architectural coatings in the uncontrolled ROG emissions reflects the upper end of the

VOC content of coatings (150 g/L for exterior and 100 g/L for interior coatings), allowed for non-specialty coatings (effective in 2011) stated in BAAQMD's Regulation 8, Rule 3.[20]

CalEEMod provides estimates of criteria pollutant emissions from use of construction equipment and other construction-related sources.

Sources of Operational Emissions

As discussed above, the proposed project is anticipated to be constructed over an approximately 11 year period. During this time, buildings that have been construction would be occupied and operational emissions from construction of earlier phases of the project would occur simultaneously with construction of later phases of the proposed project.

The emissions increases attributable to operation of the Proposed Project would be from any required emergency standby diesel generators, which would be subject to BAAQMD permitting requirements, the increase in operational vehicle trips generated by increased use and occupation of the Proposed Project, and area sources, such as use of natural gas for heating and cooking and use of consumer product by future building occupants. San Francisco County-specific consumer product emission factor (0.000015 pounds ROG/square foot/year) was used in CalEEMod to estimate ROG emissions from the use of consumer products.

Emission estimates are based upon the following regulatory requirements:

- Emergency standby diesel generator engines compliant with CARB Tier 2 emission standards or higher, and compliant with ATCM and BACT, consistent with current regulations.
- Natural gas–fired mechanical systems compliant with BAAQMD Regulation 9, Rule 7 and BACT.
- Use of architectural coatings compliant with BAAQMD's Regulation 8, Rule 3.

Construction period emissions are quantified by phase for the Maximum Residential Scenario in **Table 6**. For example, during construction of Phase 3, Phases 1 and 2 are assumed to be operational. Therefore, the analysis adds together the construction emissions of Phase 3 and the operational emissions of Phases 1 and 2. Again, the Phases may not be undertaken exactly as laid out in the phasing diagram, so these emissions estimates are designed to provide a representative approximation. Maximum average daily uncontrolled emissions of criteria air pollutants during construction of the Maximum Residential Scenario of the Proposed Project would be 25 pounds per day of reactive organic gases (ROG) in Phase 4, 42 pounds per day of nitrogen oxides (NO_x) in Phases 1 and 2, and 1.9 pounds per day of particulate matter (PM_{10}) and 1.8 pounds per day of fine particulate matter ($PM_{2.5}$) in Phases 1 and 2. This table also shows the emission totals from the combination of later phase construction with interim operational emissions. Emissions from the combination of construction and simultaneous operations would be the greatest during construction of Phase 5, whereby operation of Phases 1-4 is expected. During this time, average daily ROG emissions would be 186 pounds per day, NOx emissions would be 112 pounds per day, PM10 emissions would be 165 pounds per day and PM2.5 emissions would be 47 pounds per day.

[20] http://hank.baaqmd.gov/dst/regulations/rg0803.pdf

TABLE 6
AVERAGE DAILY AND MAXIMUM ANNUAL
EMISSIONS FOR THE MAXIMUM RESIDENTIAL SCENARIO DURING CONSTRUCTION

	Average Daily Emissions (lb/day) Uncontrolled/Controlled)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Phase 1 and 2 Construction (888 days)	**22/20**	**42/15**	**1.9/0.24**	**1.8/0.22**
Phase 2 Construction (619 days)	23/20	33/10	1.6/0.19	1.5/0.18
Phase 1 Operation	10/9.2	6.0/5.4	3.1/2.6	1.1/0.93
Phase 2 Total	**33/29**	**39/15**	**4.7/2.8**	**2.6/1.1**
Phase 3 Construction (780 days)	21/19	28/10	1.2/0.21	1.1/0.20
Phase 1 and 2 Operation	65/53	47/37	29/21	9.5/7.1
Phase 3 Total	**86/72**	**75/47**	**31/21**	**11/7.1**
Phase 4 Construction (779 days)	25/23	24/11	0.9/0.25	0.9/0.24
Phase 1, 2 and 3 Operation	102/93	64/57	49/42	16/14
Phase 4 Total	**127/116**	**88/68**	**50/42**	**17/14**
Phase 5 Construction (780 days)	12/11	18/7.4	0.7/0.16	0.6/0.15
Phase 1, 2, 3 and 4 Operation	156/141	93/83	81/69	26/22
Phase 5 Total	**168/152**	**111/90**	**82/69**	**27/22**
Year	**Maximum Annual Emissions (Ton/year) Uncontrolled/Controlled)**			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Phase 1 and 2 Construction	**4.6/4.3**	**8.2/1.7**	**0.34/0.03**	**0.32/0.03**
Phase 2 Construction (post Phase 1)	4.6/4.3	5.0/1.7	0.23/<0.1	0.22/<0.1
Phase 1 Operation	1.8/1.7	1.1/1.0	0.56/0.8	0.19/0.26
Phase 2 Total	**6.4/6.0**	**6.1/2.7**	**0.79/0.8**	**0.41/0.26**
Phase 3 Construction	5.1/4.9	3.7/1.4	0.16/0.03	0.15/0.03
Phase 1 and 2 Operation	12/10	8.6/6.7	5.4/3.9	1.7/1.3
Phase 3 Total	**17/15**	**12/8.1**	**5.6/3.9**	**1.9/1.3**
Phase 4 Construction	6.2/6.0	3.6/1.7	0.13/0.04	0.12/0.04
Phase 1, 2 and 3 Operation	19/17	12/10	9.0/7.7	2.9/2.5
Phase 4 Total	**25/23**	**16/12**	**9.1/7.7**	**3.0/2.5**
Phase 5 Construction	2.9/2.7	2.7/1.1	0.11/0.02	0.10/0.02
Phase 1, 2, 3 and 4 Operation	29/26	17/15	15/13	4.7/4.0
Phase 5 Total	**32/29**	**20/16**	**15/13**	**4.8/4.0**

SOURCE: ESA, 2016.

Criteria pollutant emissions from use of construction equipment and other construction-related sources are quantified by phase for the Maximum Commercial Scenario in **Table 7**. Maximum average daily uncontrolled emissions of criteria air pollutants during construction of the Maximum Commercial Scenario of the Proposed Project would be 25 pounds per day of reactive

organic gases (ROG) during construction of phase 2 and 42 pounds per day of nitrogen oxides (NO_x), and 1.9 pounds per day of particulate matter (PM_{10}) and 1.8 pounds per day of fine particulate matter ($PM_{2.5}$) all during the simultaneous construction of Phases 1 and 2. This table also shows the emission totals from the combination of later phase construction with interim operational emissions. Emissions from the combination of construction and simultaneous operations would be the greatest during construction of Phase 5, whereby operation of Phases 1-4 is expected. During this time, average daily ROG emissions would be 174 pounds per day, NOx emissions would be 111 pounds per day, PM10 emissions would be 160 pounds per day and PM2.5 emissions would be 46 pounds per day.

Operational Emissions at Build Out

Criteria pollutant emissions from the anticipated operation-related sources at project buildout (2030) are quantified in **Table 8** and **Table 9** for the Maximum Residential and Maximum Commercial Scenarios, respectively.

An emission controlled scenario was also run which assumed the following controls:

- All off-road equipment greater than 25 horsepower shall have engines that meet the EPA or CARB Tier 4 off-road emission standards and be fueled with renewable diesel (at least 99 percent renewable diesel or R99), if commercially available. Emission reductions from Tier 4 equipment were calculated by CalEEMod using the mitigations tab. Emission reductions from the use of renewable diesel were also calculated by CalEEMod using a the lowest percentage reduction available for oxidation catalysts (15%) which is a value close to that published for renewable diesel NOx reductions which vary from 10 to 18 percent[21].
- All 11 generators would be powered by a CARB-Approved Tier 4 engine, calculated using Tier 4 engine emission factors;
- Use of low and super-compliant VOC architectural coatings in maintaining residential buildings. Quantification of emission reductions from this measure for residential and commercial uses is based on CalEEmod default ROG emission rate for SCAQMD.
- No wood-burning fireplaces; and
- Implementation of a Transportation Demand Management program that achieves a 20 percent reduction in weekday trip generation. Quantification of emission reduction from this measure is based on a 20 percent reduction target for vehicle trips. Because most measures are expected to be employer-based, the 20 percent reduction in vehicle trips was only taken for weekday trips.

Operational emissions at full project buildout, after the completion of all five construction phases and with incorporation of the above emissions controls are also quantified in **Table 8** and **Table 9** for the Maximum Residential Scenario and the Maximum Commercial Scenario, respectively.

[21] California Air Resources Board, *Impact Assessment on Renewable Diesel on Exhaust Emissions from Compression Ignition Engines*, May 2015, p.9.

TABLE 7
AVERAGE DAILY AND MAXIMUM ANNUAL EMISSIONS
FOR THE MAXIMUM COMMERCIAL SCENARIO DURING CONSTRUCTION

	Average Daily Emissions (lb/day) Uncontrolled/Controlled)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Phase 1 and 2 Construction (888 days)	**24/21**	**42/21**	**1.9/0.25**	**1.8/0.23**
Phase 2 Construction (619 days)	25/23	34/11	1.6/0.2	1.5/0.2
Phase 1 Operation	10/9.2	6.0/5.4	3.1/2.6	1.1/0.93
Phase 2 Total	**35/32**	**40/16**	**4.7/2.8**	**2.6/1.1**
Phase 3 Construction (780 days)	20/19	28/11	1.2/0.22	1.1/0.21
Phase 1 and 2 Operation	70/63	49/43	32/27	10/8.8
Phase 3 Total	**90/82**	**77/54**	**33/27**	**11/9.0**
Phase 4 Construction (779 days)	21/19	24/10	0.9/0.24	0.9/0.23
Phase 1, 2 and 3 Operation	115/103	73/64	58/49	18/16
Phase 4 Total	**136/122**	**97/74**	**59/49**	**19/16**
Phase 5 Construction (780 days)	10/8.2	18/7.5	0.7/0.15	0.6/0.15
Phase 1, 2, 3 and 4 Operation	161/144	93/81	88/74	27/23
Phase 5 Total	**171/152**	**111/89**	**88/75**	**28/23**
Year	Maximum Annual Emissions (Ton/year) Uncontrolled/Controlled)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Phase 1 and 2 Construction	**5.1/4.7**	**8.2/1.8**	**0.33/0.03**	**0.32/0.03**
Phase 2 Construction	5.0/4.7	5.2/1.8	0.24/0.03	0.23/0.02
Phase 1 Operation	1.8/1.7	1.1/1.0	0.56/0.48	0.19/0.17
Phase 2 Total	**6.8/6.4**	**6.3/2.8**	**0.80/0.51**	**0.42/0.19**
Phase 3 Construction	5.0/4.8	3.8/1.5	0.16/0.03	0.15/0.03
Phase 1 and 2 Operation	13/11	9.0/7.9	5.9/5.0	1.9/1.6
Phase 3 Total	**18/16**	**13/9.4**	**6.1/5.0**	**2.1/1.6**
Phase 4 Construction	5.2/5.0	3.6/1.5	0.13/0.04	0.12/0.03
Phase 1, 2 and 3 Operation	21/19	13/12	11/9.0	3.3/2.9
Phase 4 Total	**26/24**	**17/14**	**11/9.0**	**3.4/2.9**
Phase 5 Construction	2.3/2.1	2.8/1.1	0.11/0.02	0.10/0.02
Phase 1, 2, 3 and 4 Operation	30/26	17/15	16/14	4.9/4.2
Phase 5 Total	**32/28**	**20/16**	**16/14**	**5.0/4.2**

SOURCE: ESA, 2016.

TABLE 8
AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS AT PROJECT BUILDOUT FOR THE MAXIMUM RESIDENTIAL SCENARIO

	Average Daily Emissions (lb/day)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[a] (Uncontrolled/Controlled)	81.6/75.1	1.4/1.4	0.7/0.7	0.7/0.7
Natural Gas Combustion	2.6	23.0	1.8	1.8
Vehicle Trips (Uncontrolled/Controlled)	89.9/76.2	67.8/57.5	86.6/74.5	24.7/21.9
Stationary Source (generators) Uncontrolled/Controlled	1.5/0.20	18.7/2.0	1.3/0.02	1.3/0.02
Total (Uncontrolled/Controlled)	**176/154**	**111/84**	**90/77**	**29/22**
	Maximum Annual Emissions (Ton/year)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[a] (Uncontrolled/Controlled)	14.9/13.7	0.26/0.26	0.13/0.13	0.13/0.13
Natural Gas Combustion	0.48	4.2	0.33	0.33
Vehicle Trips (Uncontrolled/Controlled)	16.4/13.9	12.4/10.5	15.8/13.6	4.5/4.0
Stationary Source (generator) Uncontrolled/Controlled	0.28/0.03	3.4/0.40	0.24/0.004	0.24/0.004
Total (Uncontrolled/Controlled)	**32/28**	**20/15**	**17/14**	**5.2/4.5**

[a] Area sources include landscape maintenance equipment, fireplace emissions, use of commercial products, and maintenance application of architectural coatings

SOURCE: ESA, 2016; Ramboll/ENVIRON, 2016.

TABLE 9
AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS AT PROJECT BUILDOUT FOR THE MAXIMUM COMMERCIAL SCENARIO

	Average Daily Emissions (lb/day)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[a] (Uncontrolled/Controlled)	78.4/72.3	0.8/0.8	0.4	0.4
Natural Gas Combustion	2.4	21.4	1.6/1.6	1.6/1.6
Vehicle Trips (Uncontrolled/Controlled)	98.1/82.2	74.5/62.5	96.4/81.1	28.5/24.1
Stationary Source (generator) Uncontrolled/Controlled	1.5/0.16	18.7/2.0	0.20/0.02	0.20/0.02
Total (Uncontrolled/Controlled)	**180/157**	**115/87**	**99/84**	**31/26**
	Maximum Annual Emissions (Ton/year)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Source (Uncontrolled/Controlled)	14.3/13.2	0.14/0.14	0.07/0.07	0.07/0.07
Natural Gas Combustion	0.44	3.9	0.30	0.30
Vehicle Trips (Uncontrolled/Controlled)	17.9/15.0	13.6/11.4	17.6/14.8	5.2/4.3
Stationary Source (generator) Uncontrolled/Controlled	0.28/0.03	3.4/0.36	0.24/0.004	0.24/0.004
Total (Uncontrolled/Controlled)	**32/29**	**21/16**	**18/15**	**5.8/4.7**

[a] Area sources include landscape maintenance equipment, fireplace emissions, use of commercial products, and maintenance application of architectural coatings

SOURCE: ESA, 2015; Ramboll/ENVIRON, 2016.

Table 10 and **Table 11** present the operational emissions that would be associated with the Illinois Parcels only. Note that generators would not be required by building code for the proposed buildings on these parcels because building height would be restricted to less than 70 feet.

TABLE 10
ILLINOIS PARCELS ONLY AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS AT PROJECT BUILDOUT FOR THE MAXIMUM RESIDENTIAL SCENARIO

	Average Daily Emissions (lb/day)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[a] (Uncontrolled/Controlled)	16/16	0.38/0.38	0.22/0.22	0.22/0.22
Natural Gas Combustion	0.49	4.4	0.33	0.33
Vehicle Trips (Uncontrolled/Controlled)	7.7/6.6	5.5/4.7	7.1/6.0	2.0/1.8
Total (Uncontrolled/Controlled)	**24/21**	**10/9**	**7.8/6.6**	**2.6/2.3**
	Maximum Annual Emissions (Ton/year)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[a] (Uncontrolled/Controlled)	3.0/2.7	0.07/0.07	0.04/0.04	0.04/0.04
Natural Gas Combustion	0.09	0.80	0.06	0.06
Vehicle Trips (Uncontrolled/Controlled)	1.4/1.2	1.0/0.85	1.3/1.1	0.37/0.32
Total (Uncontrolled/Controlled)	**4.4/3.9**	**1.9/1.7**	**1.4/1.2**	**0.48/0.42**

[a] Area sources include landscape maintenance equipment, fireplace emissions, use of commercial products, and maintenance application of architectural coatings

SOURCE: ESA, 2016.

TABLE 11
ILLINOIS PARCELS ONLY AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS AT PROJECT BUILDOUT FOR THE MAXIMUM COMMERCIAL SCENARIO

	Average Daily Emissions (lb/day)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[a] (Uncontrolled/Controlled)	15/13	0.27/0.27	0.11	0.11
Natural Gas Combustion	0.44	3.89	0.33	0.33
Vehicle Trips (Uncontrolled/Controlled)	7.5/6.3	5.6/4.7	7.1/6.0	2.1/1.8
Total (Uncontrolled/Controlled)	**22/20**	**10/8.8**	**7.7/6.6**	**2.6/2.2**
	Maximum Annual Emissions (Ton/year)			
	ROG	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[a] (Uncontrolled/Controlled)	2.7/2.4	0.05/0.05	0.02/0.02	0.02/0.02
Natural Gas Combustion	0.08	0.71	0.06	0.06
Vehicle Trips (Uncontrolled/Controlled)	1.37/1.15	1.03/0.86	1.3/1.1	0.39/0.32
Total (Uncontrolled/Controlled)	**4.1/3.7**	**1.8/1.6**	**1.4/1.2**	**0.47/0.41**

[a] Area sources include landscape maintenance equipment, fireplace emissions, use of commercial products, and maintenance application of architectural coatings

SOURCE: ESA, 2016.

Localized Carbon Monoxide

Emissions from traffic at congested intersections can, under certain circumstances, cause a localized build-up of CO concentrations. Regional ambient air quality monitoring data demonstrate that CO concentrations are well below the applicable standards, despite long-term upward trends in vehicle miles traveled. This confirms that the potential for localized increases in CO concentrations from increased traffic has been greatly reduced in recent years. Improvements in motor vehicle exhaust controls since the early 1990s and the use of oxygenated fuels have significantly reduced CO emissions from motor vehicles.

Elevated concentrations of localized CO from congested traffic would not have the potential to cause a violation of ambient air quality standards because the following three criteria would be met[22]:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans. Nearby transit services include a MUNI light rail stop at third and 20th Street, 500 feet from the project site, and a Caltrain Stop at 22nd Street, less than one-half mile from the project site, both of which operate from 6 a.m. to 12:00 a.m. The Proposed Project would be consistent with these regional plans by increasing density in an area proximate to transit options.
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. The Transportation Study[23] indicates that the study intersections with the highest volumes would experience fewer than 10,000 vehicles per peak hour under existing plus project and cumulative scenarios.
- The project traffic would not increase traffic volumes at affected intersections where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

Because each of the three criteria would be met, elevated concentrations of localized CO from congested traffic would not cause a violation of ambient air quality standards[24].

V. Community Risk and Hazards

Introduction

Ramboll Environ, an environmental consulting firm, evaluated the potential for adverse health effects associated with toxic air contaminant exposures to residential and other sensitive receptors at and around the project site for both the Maximum Residential and Maximum Commercial Scenarios discussed previously. This section of the report presents a health risk analysis for on-site and off-site sensitive receptors resulting from implementation of the Project. This health risk assessment discusses the anticipated excess lifetime cancer risk (risk) and $PM_{2.5}$ concentrations for on-site and off-site receptors resulting from construction of the five phases, operation of eleven new on-site generators, and the increased traffic within the project area.

22 Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2011, page 3-3.
23 Fehr & Peers, *Transportation Impact Study, Pier 70 Mixed- Use District Project*, December 2016
24 Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2011, page 3-3.

The project-level health risk assessment was conducted using the AERMOD air dispersion model and utilized the same receptor grid used in San Francisco's citywide modeling for the development of its Community Risk Reduction Program. The receptor grid used is based on the City's 20 meter receptor grid. Sensitive receptors with the greatest cancer risk and $PM_{2.5}$ exposure from the Proposed Project and in combination with existing sources were identified as the maximally exposed individual sensitive receptor (MEISR).

This section of the AQTR discusses community health risks and hazard as evaluated in a health risk assessment. A health risk assessment is used to determine if a particular chemical poses a significant risk to human health and, if so, under what circumstances. Toxic air contaminants (TACs) are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A wide range of sources, from industrial plants to motor vehicles, emit TACs.

The cumulative risk analysis for construction and operation estimated potential diesel and $PM_{2.5}$ impacts on the sensitive receptors, including occupied dwellings and schools within the project site and 1,000 meters from the project boundary, consistent with Citywide CRRP modeling.

This assessment estimated DPM, speciated total organic gas (TOG), and $PM_{2.5}$ concentrations based on data generated by CalEEMod for construction and operational project vehicle traffic. Operational contributions from emergency standby generators were based on calculations using emission rates published by U.S. EPA. DPM, TOG, and $PM_{2.5}$ emissions rates were used as input into AERMOD to predict worst case DPM, TOG, and $PM_{2.5}$ concentrations, respectively. AERMOD is also the model that was used by BAAQMD in the Citywide modeling conducted for the development of the Community Risk Reduction Plan. DPM and speciated TOG concentrations were then used to determine excess lifetime cancer risk based on the health risk assessment methodology published by the Office of Environmental Health Hazard Assessment (OEHHA) in 2015. Construction activities were modeled as area sources, haul trips and operational trips as adjacent volume sources, and operational generators as point sources.

The DPM and $PM_{2.5}$ concentrations for each phase of construction due to construction activities and haul trips were modeled separately by year of construction, to account for emissions specific to construction activities occurring in specific time periods. Operational on-road traffic and emergency generators were also modeled for on- and off-site receptors. The excess cancer risk and $PM_{2.5}$ concentrations from all sources (ambient [for $PM_{2.5}$ only] plus project construction, operation, and traffic sources) as well as the cumulative risk from the sum of all sources for each receptor point was then determined. The following discussion summarizes the analysis methods of the health risk assessment (HRA).

Air Dispersion Model Selection

Near-field air dispersion modeling of DPM from project sources was conducted using the USEPA's AERMOD model (version 15181, USEPA 2012).[25] For each receptor location, the

[25] On November 9, 2005, the USEPA promulgated final revisions to the federal Guideline on Air Quality Models, in which it recommended that AERMOD be used for dispersion modeling evaluations of criteria air pollutant and

model generates annual average air concentrations (or air dispersion factors as unit emissions) that result from emissions from multiple sources. Air dispersion models such as AERMOD require a variety of inputs such as emissions source parameters, meteorological parameters, topography information, and receptor parameters. When site-specific information is unknown, Ramboll Environ used default parameter sets that are designed to produce conservative (i.e. overestimates of) air concentrations.

Meteorological Data

Air dispersion modeling applications require the use of meteorological data that ideally are spatially and temporally representative of conditions in the immediate vicinity of the site under consideration. For the HRA, meteorological data collected and processed by BAAQMD[26] at the Mission Bay station were used. This 2008 meteorological data for Mission Bay was used for consistency with the Citywide CRRP modeling.

Receptors

Air concentrations were evaluated at locations within 1 kilometer of the project boundary. Construction of the Project is split to five phases, and residents would be on-site in earlier phases while later phases of the project are constructed. Therefore, both on-site and off-site receptors were evaluated. For on-site residential receptors a 20 meter by 20 meter receptor grid was placed on the project site footprint to represent on-site residential locations. Residential receptors were placed at different locations under the Maximum Residential and Commercial Scenarios discussed previously, as shown in Figures 3 and 4, respectively.

Modeling Adjustment Factors

The modeling adjustment factor accounts for the averaging of emissions. OEHHA (2015) recommends applying an adjustment factor to the annual average concentration modeled assuming continuous emissions (i.e., 24 hours per day, 7 days per week), when the actual emissions are less than 24 hours per day and exposures are concurrent with construction and/or operation activities occurring as part of the Project.

Residents were assumed to be exposed to annual construction emissions (averaged from actual construction hours) and operation emissions 24 hours per day, 7 days per week. This assumption is consistent with the modeled annual average air concentration (24 hours per day, 7 days per week). Thus, the annual average concentration was not adjusted for analysis of residential receptors.

Construction emissions only impact school child receptors during the 13 hours per day and five days per week during which construction activities would occur. However the emissions modeled during those hours were annualized assuming 24 hour per day in the modeling outputs. Thus, a modeling adjustment factor of 2.58 (24 hours/13 hours * 7 days/5 days) must be applied to the

toxic air pollutant emissions from typical industrial facilities. USEPA Preferred/Recommended Models, *AERMOD Modeling System*, http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod.

26 The Mission Bay Meteorological Station is situated near Channel Street (latitude: 37.7722N, longitude: 122.3947W). Available at: http://hank.baaqmd.gov/tec/data/metdata5803.html

annual average concentration used in the evaluation to account for an emissions exposure schedule that would not occur 24 hours per day, seven days per week.

Source Configurations – Construction

Emitting construction activities were modeled between 7 AM and 8 PM, 5 days a week to reflect the duration of construction activities. Emissions were modeled such that each phase had unit emission rates (i.e., 1 gram per second per square meter [$g/s/m^2$]), and the model estimated annual average dispersion factors. To calculate annual average ambient air concentrations by phase, the annual average dispersion factors were multiplied by the average annual emission rates by phase.

Source Configurations – Operation

For the relatively few hours of operation per year that emergency standby diesel generators actually operate, emissions from maintenance operations of the emergency standby diesel generators (50 hours per year) were averaged and modeled 24 hours per day, 7 days a week, and the operational hours were not restricted to a particular chronological event in order to conservatively estimate the generator impacts. Emissions from project-generated traffic were modeled 24 hours a day, with an hour-of-day temporal profile reflecting the fluctuation of traffic volume in San Francisco County, extracted from EMFAC 2011. Emissions from consumer products (cleaning supplies) and boilers were not included because these sources produce negligible TAC and $PM_{2.5}$ emissions.

To calculate annual average ambient air concentrations, the annual average dispersion factors were multiplied by the average annual emission rates for each potential generator. Emissions from project-generated traffic were modeled similar to construction haul trucks (discussed below). To calculate annual average ambient air concentrations by phase, the annual average dispersion factors were multiplied by the average annual emission rates by phase.

Emission Source Parameters – Construction

During construction there would be multiple emission sources associated with the movement of equipment within the construction site. On-site construction off-road equipment emissions were modeled as surface-based area sources with a release height of 5 meters and an initial vertical dimension of 1.4 meters, consistent with the San Francisco Community Risk Reduction Plan (CRRP) modeling[27]. Haul trips are modeled using adjacent volume sources with a release height of 2.5 meters and plume width based on roadway width, consistent with the Citywide CRRP modeling. Haul trips have the potential for three different routes. Route A would travel along 22nd to Illinois and the then south on Illinois to Cargoway to 3rd Street to the South Bound On-Ramp to U.S.Highway101. Route B would travel along 22nd to 3rd Street, take 3rd Street to Cesar Chavez, and Cesar Chavez to the South Bound On-Ramp to U.S.Highway101. Route 3 would travel 22nd Street to Illinois, Illinois to 24th Street, 25th Street to Pennsylvania and Pennsylvania to the I-280 South Bound On-Ramp to I-280. Because it is unknown exactly how many trips would occur along each

[27] BAAQMD, SFDPH, San Francisco Planning Department. 2012. The San Francisco Community Risk Reduction Plan: Technical Support Documentation. December.

route, a worst case scenario was modeled assuming all trucks traveled along the same route. Each segment of each roadway was modeled to estimate total project emissions.

Emissions Source Parameters – Operation

Project-related operational emissions result from project-specific traffic along local roadways and the generators. Source parameters for the roadways and generators are as follows.

Roadways were modeled as surface based adjacent volume sources. Release height is 2.5 meters to remain consistent with the Citywide CRRP modeling.

The generators were modeled as a point source with a release height of 3.7 meters, as per Citywide CRRP modeling. The location of the generator is based on buildings anticipated to exceed 70 feet (shown in **Figure 5**, **Proposed Height Limit Plan**) and were located closest to the nearest residential land use as a conservative estimate. Gas exit temperature is 740°K. Stack inside diameter is 0.18 meter. Stack exit velocity is 45.3 m/s.

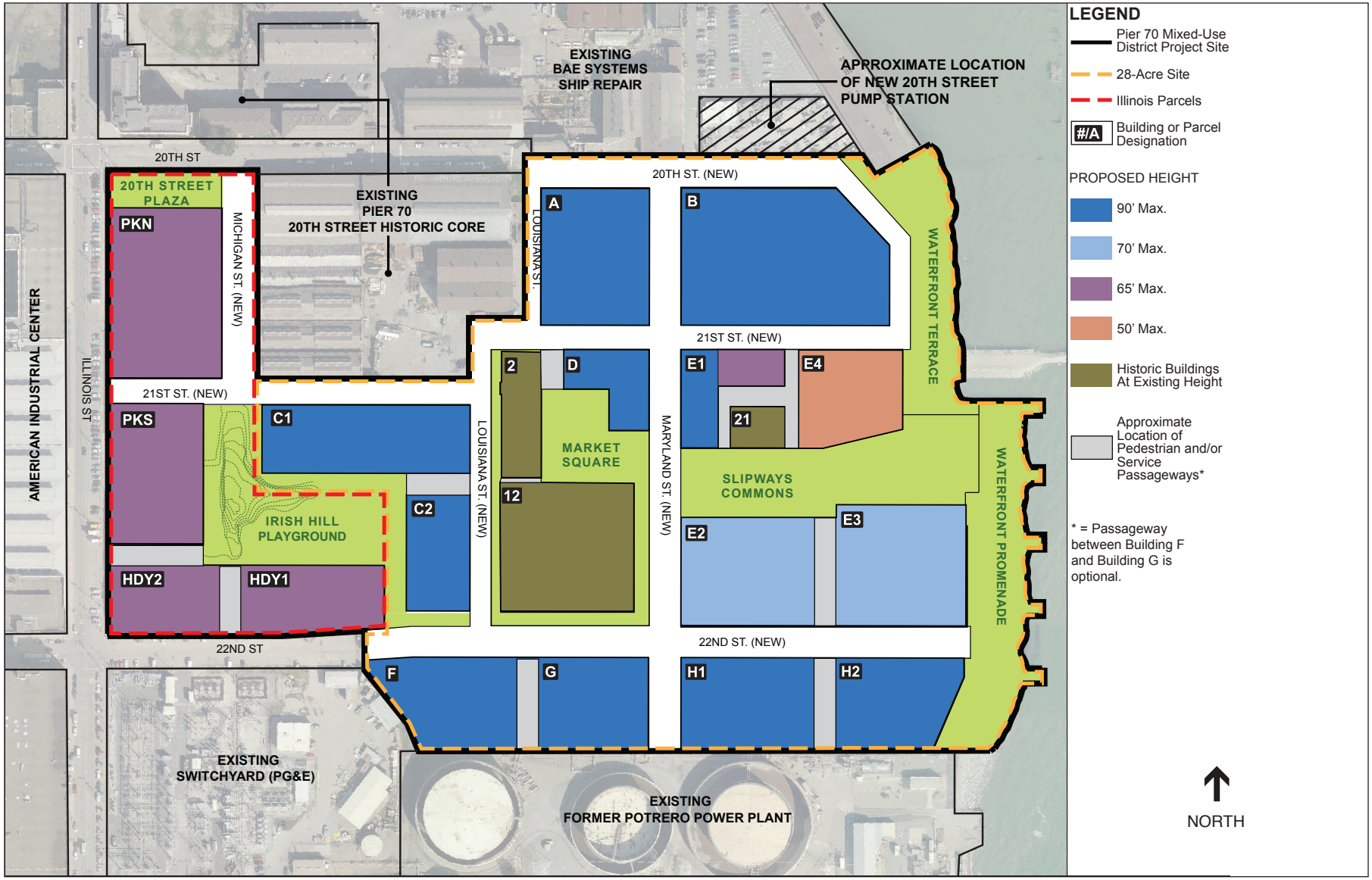
Risk and Hazard Calculations: Dose/Risk

Exposure Assessment

Cancer risk and $PM_{2.5}$ concentrations were evaluated for project construction assuming a duration of approximately 12 years divided into five phases and project operation consisting of non-emergency maintenance and testing of emergency diesel generators as well as project-generated vehicle traffic during both construction and operation.

This analysis conservatively evaluated the exposure and risks to off-site and on-site child residents for the project construction as well as off-site and on-site 30-year residents during project operation consistent with OEHHA's 2015 guidance. Consistent with this analysis, Citywide CRRP results were scaled up to reflect OEHHA 2015 guidance before being included in the cumulative evaluation. In addition, exposure of the nearby schools to project construction and operation were evaluated in the HRA. Because two project configurations are being considered that generate construction and operation emissions, both on- and off-site receptors were evaluated for construction and operation of each project scenario separately.

As mentioned above, on-site residents may be present during construction of the later phases. For example, residential receptors located in Phase 1 (the first construction phase) are anticipated to be exposed to construction emissions from Phases 2, 3, 4, and 5 whereas residential receptors located in Phase 5 (the last construction phase) would not be exposed to any project-related construction emissions. Additionally, as discussed previously the two project scenarios evaluated included receptors in different locations and present during different phases of construction. Receptor configurations under both scenarios were evaluated. As discussed further below, the HRA includes age sensitivity factors, which are used to adjust estimated excess lifetime cancer risks for a resident child to account for an "anticipated special sensitivity to carcinogens" of infants (i.e. during pregnancy and after birth) and children through age 16 as recommended in the OEHHA 2015 guidance. The HRA assumes that a third-trimester in-utero fetus would move into the newly developed residences of each phase and therefore represents a worst case risk and emissions scenario.



SOURCE: Sitelab Studio, Turnstone Consulting/SWCA, 2015

Case No. 2014-001272SHD: Pier 70 Mixed Use District Project Air Quality Technical Report . 130688

Figure 5
Proposed Height Limit Plan

Off-site child residents (living adjacent to the project site and not within any of the project's phases) were assumed to be present at one location during the entire construction period and were evaluated for both project scenarios. Off-site and on-site 30-year residents were assumed to be present at one location during the entire 30 year period.

Calculation of Intake Dose

The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * FAH * EF * ED * CF}{AT}$$

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
FAH	=	Fraction of Time at Home (unitless)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
CF	=	Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor by the chemical concentration in air. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the OEHHA Hot Spots guidance.[28] The input values for the intake factor calculation are presented and explained in Appendix B, tables B1 through B3.

Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories – cancer and non-cancer health effects. Toxicity values used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a risk assessment.

Cancer risk calculations for both project construction and operation utilized the toxicity values for DPM. Excess lifetime cancer risks[29] were estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential

[28] OEHHA. 2015. *Adoption of Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. March. http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[29] Excess cancer risk as a result of the proposed project is the risk generated by that project that exceeds the risk that would otherwise exist.

carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific cancer potency factor (CPF).

Age Sensitivity Factors

As mentioned previously, the estimated excess lifetime cancer risk for a resident child was adjusted using the age sensitivity factors (ASFs) recommended by OEHHA.[30] This approach accounts for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates are weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 to 70 years. The ASF for each population evaluated is presented in Appendix B Table B4.

Cancer Risk Calculation

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Risk_{inh} = C_i \times CF \times IF_{inh} \times CPF \times ASF$$

Where:

$Risk_{inh}$ = Cancer Risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)

C_i = Annual Average Air Concentration for $Chemical_i$ ($\mu g/m^3$)

CF = Conversion Factor ($mg/\mu g$)

IF_{inh} = Intake Factor for Inhalation (m^3/kg-day)

CPF_I = Cancer Potency Factor for $Chemical_i$ $(mg\ chemical/kg\ body\ weight\text{-}day)^{-1}$

ASF = Age Sensitivity Factor (unitless)

The cancer potency factor for DPM, the only chemical evaluated for construction equipment and generator operation, is 1.1 $(mg/kg\text{-}day)^{-1}$. The other inputs for the cancer risk calculation are presented in Appendix A.

Results of Project Risk and Hazard Assessment

The estimated health risks and annual $PM_{2.5}$ concentrations from construction (for both the controlled and uncontrolled scenarios) and operation of the Proposed Project are presented in **Table 12** for off-site receptors for both the Maximum Commercial and Maximum Residential Scenarios and **Table 13** for on-site receptors for both Scenarios. The controlled scenario includes use of Tier 4 construction equipment for construction of Phases 3 through 5. Furthermore, the controlled scenario assumes all Tier 4 emergency generators and implementation of

[30] OEHHA. 2015. *Adoption of Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. March. Page 8-5.

Transportation Demand Management (TDM) measures that would result in a 20% reduction in vehicle trips. Results are presented separately for each receptor type because the exposure contributions would be different for on-site receptors and off-site receptors. Off-site receptors would potentially be exposed to construction-related emissions of all phases, while this would not be true of on-site receptors. Note that the maximum excess lifetime cancer risks for combined construction impacts and combined operational impacts are represented at the same location; however, the impacts for the uncontrolled and controlled source categories do not necessarily occur at the same location because of the reduced contribution from construction sources under the controlled scenario. The maximally exposed individual sensitive receptor (MEISR) for the project impact was used to identify the impact at the receptor point for all cumulative sources; the results presented represent the values at the cumulative MEISR and may not reflect the maximum impact for construction or operation alone, so as to report the worst case condition. The locations of the MEISR for all scenarios are graphically presented in Appendix B.

TABLE 12
MODELED EXCESS LIFETIME CANCER RISK AND $PM_{2.5}$ CONCENTRATION AT OFF-SITE MEISR

Source	Lifetime Excess Cancer Risk (in one million)		PM2.5 Concentration (µg/m3)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
MAXIMUM RESIDENTIAL SCENARIO				
Residential Receptor				
Construction - Offroad Emissions	15	14	0.072	0.072
Construction - Vehicle Traffic	0.12	0.12	3.0E-04	3.0E-04
Operation –Generators	0.74	0.074	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.65	0.55	0.024	0.020
Project Total Contribution	16	14	0.09	0.09
School Receptor				
Construction - Offroad Emissions	4.8	3.4	0.072	0.072
Construction - Vehicle Traffic	0.07	0.069	3.0E-04	3.0E-04
Operation –Generator	0.14	0.014	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.12	0.11	0.024	0.020
Project Total Contribution	5.1	3.6	0.097	0.092
MAXIMUM COMMERCIAL SCENARIO				
Residential Receptor				
Construction - Offroad Emissions	16	14	0.073	0.073
Construction - Vehicle Traffic	0.47	0.47	3.0E-04	3.0E-04
Operation –Generators	0.73	0.073	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.44	0.37	0.024	0.020
Project Total Contribution	18	15	0.09	0.09
School Receptor				
Construction - Offroad Emissions	4.7	3.5	0.073	0.073
Construction - Vehicle Traffic	0.07	0.07	3.0E-04	3.0E-04
Operation –Generator	0.14	0.01	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.12	0.10	0.024	0.020
Project Total Contribution	5.0	3.7	0.098	0.093

SOURCE: Ramboll Environ, October 2016

Note: All totals are rounded to two significant figures.

TABLE 13
MODELED EXCESS LIFETIME CANCER RISK AND $PM_{2.5}$ CONCENTRATION AT ON-SITE MEISR

Source	Lifetime Excess Cancer Risk (in one million)		PM2.5 Concentration (µg/m3)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
Maximum Residential Scenario				
Construction - Offroad Emissions	81	20	0.24	0.058
Construction - Vehicle Traffic	0.30	0.17	1.1E-04	3.1E-04
Operation –Generators	2.9	0.13	0.0065	1.7E-04
Operation – Vehicle Traffic	0.19	0.31	0.0027	0.011
Project Contribution Total	84	20	0.25	0.070
Maximum Commercial Scenario				
Construction - Offroad Emissions	78	51	0.24	0.15
Construction - Vehicle Traffic	0.043	0.20	1.0E-04	4.0E-04
Operation –Generators	4.9	0.11	0.0065	1.5E-04
Operation – Vehicle Traffic	0.073	0.38	0.0027	0.014
Project Contribution Total	83	51	0.25	0.16

SOURCE: Ramboll Environ, October 2016

Note: All totals are rounded to two significant figures.

Results of Cumulative Risk and Hazard Assessment

The cumulative health risks and annual $PM_{2.5}$ concentrations from construction and operation of the Proposed Project for the controlled scenario, inclusive of all existing sources are presented in **Table 14** and **Table 15** for off-site receptors for the Maximum Residential Scenario and the Maximum Commercial Scenario, respectively. **Table 16** presents the same information for on-site receptors. These risks and concentrations also include estimated cumulative health risks and annual $PM_{2.5}$ concentrations from permitted sources and roadway traffic on local roadways for off-site and on-site receptors. Construction-controlled emissions assume use of off-road construction equipment with USEPA's Tier 4 emissions standards. The locations of the MEISR for all scenarios are graphically presented in Appendix B. As mentioned, identification of the MEISR was determined considering the cumulative contribution of all sources; however, the uncontrolled and controlled results presented may be at different receptor locations. Although MEISR locations are based on Project impacts only, at no point (under the controlled scenario) in the modeled receptor grid do the project (plus existing) impacts create an Air Pollutant Exposure Zone (APEZ), and the Project does not overlap with an APEZ. For any off-site area that is already in an APEZ, the Project would contribute an excess cancer risk of less than 7 per one million or PM2.5 contributions less than 0.2 $\mu g/m^3$. Furthermore, the Cumulative 2040 results would be lower than shown here because a review of the City's 2040 Citywide modeling indicates that background emissions in 2040 are reduced from existing emissions, likely due to vehicle emissions standards and regulations which reduce tailpipe emissions. Similarly, the project's contribution to emissions from vehicles in 2040 would be reduced from that shown here.

TABLE 14
CUMULATIVE CANCER RISK AND $PM_{2.5}$ CONCENTRATION AT OFF-SITE MEISR FOR THE MAXIMUM RESIDENTIAL SCENARIO

Source	Lifetime Excess Cancer Risk (in one million)		PM2.5 Concentration (µg/m3)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
Residential Receptor				
Background	44	44	8.4	8.4
Construction - Offroad Emissions	15	14	0.072	0.072
Construction - Vehicle Traffic	0.12	0.12	3.0E-04	3.0E-04
Operation –Generators	0.74	0.074	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.65	0.55	0.024	0.020
Cumulative Total	60	58	8.5	8.5
School Receptor – Construction				
Background	44	44	8.4	8.4
Construction - Offroad Emissions	4.8	3.4	0.072	0.072
Construction - Vehicle Traffic	0.07	0.069	3.0E-04	3.0E-04
Cumulative Construction Total	49	47	8.5	8.5
School Receptor – Operation				
Background	44	44	8.4	8.4
Operation –Generators	0.14	0.014	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.12	0.11	0.024	0.020
Cumulative Operational Total	44	44	8.4	8.4
Cumulative Total (Construction + Operation)	49	47	8.5	8.5

SOURCE: Ramboll Environ, October 2016

Note: All totals are rounded to two significant figures

TABLE 15
CUMULATIVE CANCER RISK AND $PM_{2.5}$ CONCENTRATION AT OFF-SITE MEISR FOR THE MAXIMUM COMMERCIAL SCENARIO

Source	Lifetime Excess Cancer Risk (in one million)		PM2.5 Concentration (µg/m3)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
Residential Receptor				
Background	51	51	8.4	8.4
Construction - Offroad Emissions	16	14	0.073	0.073
Construction - Vehicle Traffic	0.47	0.47	3.0E-04	3.0E-04
Operation –Generators	0.73	0.073	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.44	0.37	0.024	0.020
Cumulative Total	68	66	8.5	8.5
School Receptor – Construction				
Background	44	44	8.4	8.4
Construction - Offroad Emissions	4.7	3.5	0.073	0.073
Construction - Vehicle Traffic	0.07	0.07	3.0E-04	3.0E-04
Cumulative Construction Total	49	47	8.5	8.5
School Receptor – Operation				
Background	44	44	8.4	8.4
Operation –Generators	0.14	0.014	9.8E-04	9.8E-05
Operation – Vehicle Traffic	0.12	0.10	0.024	0.020
Cumulative Operational Total	44	44	8.5	8.5
Cumulative Total (Construction + Operation)	49	48	8.5	8.5

SOURCE: Ramboll Environ, October 2016

Note: All totals are rounded to two significant figures

TABLE 16
CUMULATIVE CANCER RISK AND $PM_{2.5}$ CONCENTRATION AT ON-SITE MEISR

Source	Lifetime Excess Cancer Risk (in one million)		PM2.5 Concentration (µg/m3)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
Maximum Residential Scenario				
Background	36	34	8.3	8.4
Construction - Offroad Emissions	81	20	0.24	0.058
Construction - Vehicle Traffic	0.30	0.17	1.1E-04	3.1E-04
Operation –Generators	2.9	0.13	0.0065	1.7E-04
Operation – Vehicle Traffic	0.19	0.31	0.0027	0.011
Cumulative Total	120	54	8.6	8.4
Maximum Commercial Scenario				
Background	27	35	8.3	8.4
Construction - Offroad Emissions	78	51	0.24	0.15
Construction - Vehicle Traffic	0.043	0.20	1.0E-04	4.0E-04
Operation –Generators	4.9	0.11	0.0065	1.5E-04
Operation – Vehicle Traffic	0.073	0.38	0.0027	0.014
Cumulative Total	110	86	8.6	8.6

SOURCE: Ramboll Environ, October 2016

Note: All totals are rounded to two significant figures

The maximum cancer risk for the school receptor is not necessarily cumulative for construction and operational emissions due to and a12-year construction duration and the assumed 12 year exposure duration for school children. However, a theoretical summed operational and construction exposure is provided as a conservative estimate of worst-case total cancer risk increase at a single receptor. Reported total concentrations of $PM_{2.5}$ are conservative in that they assume that worst case construction-related emissions exposure would occur simultaneously with worst case operational emissions exposure.

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APPENDIX E: BIOLOGICAL RESOURCES

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Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Plant Species Listed or Proposed for Listing					
Franciscan manzanita *Arctostaphylos franciscana*	FE	--	1B.1	Open, rocky, serpentine outcrops in chaparral. February – April	**No Potential.** No manzanita shrubs were observed during the reconnaissance survey of the Project Site, including Irish Hill where serpentine soils occur. This species was rediscovered in Presidio National Park in late 2009 after being believed to be extinct in the wild (although still extant through cultivation).
San Bruno Mountain manzanita *Arctostaphylos imbricata*	--	CE	1B.1	Chaparral and coastal scrub, usually on sandstone outcrops. February – May	**No Potential.** No manzanita shrubs were observed during the reconnaissance survey of the Project Site and the supportive vegetation community for this species is not found within the study area. Regional occurrences are restricted to San Bruno Mountain and the Santa Cruz Mountains; therefore this species is not expected on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Presidio manzanita *Arctostaphylos montana ssp. ravenii*	FE	CE	1B.1	Open, rocky, serpentine slopes in chaparral, coastal scrub, and coastal prairie. February – March	**No Potential.** No manzanita shrubs were observed during the reconnaissance survey of the Project Site, including Irish Hill where serpentine soils occur; however, the supportive vegetation community for this species is not found within the study area and therefore this species is not expected on site.
Pacific manzanita *Arctostaphylos pacifica*	--	CE	1B.2	Coastal scrub and chaparral. February – April	**No Potential**. No manzanita shrubs were observed during the reconnaissance survey of the Project Site and the supportive vegetation community for this species is not found within the study area; therefore this species is not expected on site.
Marsh sandwort *Arenaria paludicola*	FE	CE	1B.1	Freshwater or brackish marshes and swamps. May – August	**No Potential**. No suitable habitat on site; species presumed extirpated in San Francisco.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Robust spineflower *Chorizanthe robusta var. robusta*	FE	--	1B.1	Sandy or gravelly coastal dunes, coastal scrub, cismontane woodland and maritime chaparral. April – September	**No Potential**. This species is not expected as there is no suitable habitat on site.
Presidio clarkia *Clarkia franciscana*	FE	CE	1B.1	Serpentine outcrops in coastal scrub, and valley and foothill grassland. May – July	**No Potential.** Serpentine outcrop habitat within the Project Site is small, fragmented and highly disturbed, and provides only marginal habitat for this species. This species is not known to occur in disturbed areas. Species assemblages associated with known occurrences of this species are not consistent with site conditions. Rare plant surveys of Irish Hill in 2016 were negative for this species.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Marin western flax *Hesperolinon congestum*	FT	CT	1B.1	Chaparral and grassland, usually on serpentine barrens. April – July	**No Potential.** Serpentine habitat within the Project Site is small, fragmented, and heavily disturbed. This species requires sparse vegetation on shallow soils, and is not known to occur in isolated, heavily disturbed habitat.
Beach layia *Layia carnosa*	FE	CE	1B.1	Sand dunes. March – July	**No Potential.** This species is not expected as there is no suitable habitat on site.
San Francisco lessingia *Lessingia germanorum*	FE	CE	1B.1	Coastal scrub, sandy soils free of competing species. July – November	**No Potential.** This species is not expected as there is no suitable habitat on site.
White rayed pentachaeta *Pentachaeta bellidiflora*	FE	CE	1B.1	Open, dry, rocky slopes and grassy areas, usually on serpentine. March – May	**No Potential.** Serpentine habitat within the Project Site is small, fragmented and heavily disturbed. There are no known occurrences of this species in habitats similar to that on site. Rare plant surveys of Irish Hill in 2016 were negative for this species.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
San Francisco popcornflower *Plagiobothrys diffusus*	--	CE	1B.1	Coastal prairie, and valley and foothill grasslands. March – June	**No Potential.** This species is not expected as there is no suitable habitat on site.
Adobe sanicle *Sanicula maritima*	--	Rare	1B.1	Moist clay or ultramafic soil in chaparral, coastal prairie, meadows, seeps, and valley and foothill grassland. February – May	**No Potential.** This species is not expected as there is no suitable habitat on site and the nearest CNDDB[1] record for this species is considered extirpated.
California seablite *Suaeda californica*	FE		1B.1	Marshes and swamps (coastal salt) July - October	**No Potential.** A nearby CNDDB occurrence for a transplant is documented; however, the study area is out of the native range of this species. No suitable habitat is present on site.
Showy Indian (=two-fork) clover *Trifolium amoenum*	FE	--	1B.1	Valley grassland and wetland and riparian areas. Affinity to serpentine soils. April – June	**No Potential.** This species is not expected as there is no suitable habitat on site. Species requires heavy clay soils often associated with serpentine, conditions which are not present on site.

[1] California Natural Diversity Database (CNDDB) is an inventory of the status and locations of rare plants and animals in California maintained by the California Department of Fish and Wildlife and other partners.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
CNPS California Rare Plant Ranked Species					
Franciscan onion *Allium peninsulare var. franciscanum*	--	--	1B.2	Clay, volcanic, or serpentine substrate in valley and foothill grassland and cismontane woodland. May - June	**No Potential.** Only marginal habitat for this species is present within the Project Site. This species is not known to occur in disturbed areas. Species assemblages associated with known occurrences of this species are not consistent with site conditions. Rare plant surveys of Irish Hill in 2016 were negative for this species.
Bent-flowered fiddleneck *Amsinckia lunaris*	--	--	1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland. March – June	**No Potential.** This species is not expected as there is no suitable habitat on site.
Coast rockress Arabis blepharophylla	--	--	4.3	Rocky soils in broadleaf upland forest, coastal bluff scrub, coastal prairie, and coastal scrub. February - May	**No Potential.** While rocky soils occur at Irish Hill, other habitat elements preferred by this species are not present; therefore this species is not expected on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Montara manzanita *Arctostaphylos montaraensis*	--	--	1B.2	Slopes and ridges in chaparral and coastal scrub. January – March	**No Potential.** No manzanita shrubs were observed during the reconnaissance survey of the Project Site and the supportive vegetation community for this species is not found within the study area. Regional occurrences are restricted to San Bruno Mountain and mountains west of San Mateo; therefore this species is not expected on site.
Carlotta Hall's lace fern *Aspidotis carlotta-halliae*	--	--	4.2	Crevices, outcrops and slopes in chaparral and cismontane woodland, generally in serpentine soils. January - December	**Low.** While Irish Hill offers some of this species' preferred habitat elements, the dry, exposed nature of the site is inhospitable to this species; therefore this species is not expected on site.
Nuttall's (=ocean bluff) milkvetch *Astragalus nuttallii var. nuttallii*	--	--	4.2	Coastal bluff scrub and coastal dunes, January - November	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Alkali milk-vetch *Astragualus tener var. tener*	--	--	1B.2	Alkali flats, flooded grassland, playas and vernal pools. March – June	**No Potential.** No suitable habitat present; species presumed extirpated in San Francisco.
Bristly sedge *Carex comosa*	--	--	2B.1	Lake margins, marshes, swamps, coastal prairie, and valley and foothill grasslands. May – September	**No Potential** This species is not expected as there is no suitable habitat on site.
Johnny-nip *Castilleja ambigua var. ambigua*	--	--	4.2	Wet sites in coastal bluff scrub, coastal prairie, marshes and swamps, valley and foothill grassland, and at the margins of vernal pools. March - August	**No Potential.** This species is not expected as there is no suitable habitat on site.
Pappose tarplant *Centromadia parryi ssp. parryi*	--	--	1B.2	Chaparral, coastal prairie, meadows, seeps, coastal salt marshes and swamps, and vernally mesic, often alkaline, valley and foothill grasslands. May – November	**No Potential.** This species is not expected as there is no suitable habitat on site.
Point Reyes bird's-beak *Chloropyron maritimum ssp. palustre*	--	--	1B.2	Coastal salt marshes and swamps. June – October	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
San Francisco spineflower *Chorizanthe cuspidata var. cuspidata*	--	--	1B.2	Sandy terraces and slopes of coastal bluff scrub, coastal dunes, coastal prairie and coastal scrub. April – July	**No Potential.** This species is not expected as there is no suitable habitat on site.
Franciscan thistle *Cirsium andrewsii*	--	--	1B.2	Coastal bluff scrub, coastal prairie, coastal mesic scrub, and broadleaf upland forest; sometimes on serpentine soils; often associated with seeps. March – July	**No Potential.** While Irish Hill offers some of this species' preferred habitat elements, the dry, exposed nature of the site, and lack of seep habitat, is inhospitable to this species; therefore this species is not expected on site
Compact cobwebby thistle *Cirsium occidentale var. compactum*	--	--	1B.2	Coastal scrub, grassland, and dunes; often associated with seeps. April – June	**No Potential.** This species is not expected as there is no suitable habitat on site.
Round-headed Chinese-houses *Collinsia corymbosa*	--	--	1B.2	Coastal dunes and coastal prairie. April – June	**No Potential.** No suitable habitat present; species has not been seen in San Francisco for more than 100 years.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
San Francisco collinsia *Collinsia multicolor*	--	--	1B.2	On humus-covered soil derived from mudstone in closed-cone coniferous forest and coastal scrub. March – May	**No Potential.** This species is not expected as there is no suitable habitat on site.
Slender cottongrass *Eriophorum gracile*	--	--	4.3	Acidic soils in bogs, and fens, meadows and seeps, and upper montane coniferous forest. May - September	**No Potential.** This species is not expected as there is no suitable habitat on site.
San Francisco wallflower *Erysimum franciscanum*	--	--	4.2, LS	Coastal scrub and grassland, often on serpentine soils. March – June	**No Potential.** The Irish Hill portion of the Project Site provides marginal serpentine habitat for this species. Some of the known occurrences of this species are located in disturbed, weedy habitats, and thus the high level of historic disturbance within the Project Site would not preclude this species. Rare plant surveys of Irish Hill in 2016 were negative for this species.
Marsh horsetail *Equisetum palustre*	--	--	3	Freshwater marsh and wetland and riparian areas.	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Fragrant fritillary *Fritillaria liliacea*	--	--	1B.2	On clay, often serpentine derived soils in coastal scrub, grassland, and coastal prairie. February – April	**No Potential.** While Irish Hill offers some of this species' preferred habitat elements, a nearby 1895 CNDDB occurrence from Potrero Hill is extirpated; therefore this species is not expected on site.
Blue coast gilia *Gilia capitata spp. chamissonis*	--	--	1B.1	Coastal dunes and scrub. April – July	**No Potential.** This species is not expected as there is no suitable habitat on site.
Dark-eyed gilia *Gilia millefoliata*	--	--	1B.2	Coastal dunes. April – July	**No Potential.** This species is not expected as there is no suitable habitat on site.
San Francisco gumplant *Grindelia hirsutula var. maritima*	--	--	3.2	Coastal scrub and grasslands. June – September	**No Potential.** This species is not expected as there is no suitable habitat on site.
Water star-grass *Heteranthera dubia*			2B.2	Marshes and swamps (alkaline, still or slow-moving water) July-October	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Diablo helianthella *Helianthella castanea*	--	--	1B.2	On rocky soils in broadleaf upland forest, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. March – June	**No Potential.** A historical CNDDB occurrence is documented nearby the Project Site; however this species is possibly extirpated from San Francisco. Additionally, this species is not expected as there is no suitable habitat on site.
White seaside (=congested-headed hayfield) tarplant *Hemizonia congesta ssp. congesta*	--	--	1B.2	Grassy valleys and hills, often on fallow fields in coastal scrub. April – November	**No Potential.** Small undeveloped portions of the Project Site may have once supported coast grassland or coastal scrub; however these areas are highly disturbed and unsuitable for this species.
Short-leaved evax *Hesperevax sparsiflora var. brevifolia*	--	--	1B.2	Sandy bluffs and flats in coastal scrub and coastal dunes. March – June	**No Potential.** This species is not expected as there is no suitable habitat on site.
Kellogg's horkelia *Horkelia cuneata ssp. sericea*	--	--	1B.1	Coastal scrub, dunes, and openings of closed-cone coniferous forests. February – July	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Coast iris *Iris longipetala*	--	--	4.2	Coastal prairie, lower montane coniferous forest, meadows and seeps, mesic sites. March - May	**No Potential.** This species is not expected as there is no suitable habitat on site.
Rose leptosiphon *Leptosiphon rosaceus*	--	--	1B.1	Coastal bluff scrub. April – July	**No Potential.** This species is not expected as there is no suitable habitat on site.
Arcuate bush mallow *Malacothamnus arcuatus*	--	--	1B.2	Gravelly alluvium in chaparral and cismontane woodland. April – September	**No Potential.** This species is not expected as there is no suitable substrate or habitat on site.
Mt. Diablo cottonweed *Micropus amphibolus*	--	--	3.2	Valley grassland, foothill woodland, and mixed evergreen forest with an affinity to serpentine soils. March - May	**No Potential.** Serpentine outcrop habitat within the Project Site is small, fragmented and highly disturbed, and provides only marginal habitat for this species. This species is not known to occur in disturbed areas. Species assemblages associated with known occurrences of this species are not consistent with site conditions. Rare plant surveys of Irish Hill in 2016 were negative for this species.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Marsh microseris *Microseris paludosa*	--	--	1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. August – June	**Low.** Small undeveloped portions of the Project Site may have once supported coast grassland or coastal scrub; however these areas are highly disturbed and currently unlikely to support this species.
Northern curly-leaved Monardella Monardella sinuata ssp. nigrescens	--	--	1B.2	Coastal dunes and scrub, chaparral, lower montane coniferous forest. April - September	**No Potential.** This species is not expected as there is no suitable habitat on site.
Choris's popcorn-flower *Plagiobothrys chorisianus var. chorisianus*	--	--	1B.2	Mesic sites in chaparral, coastal scrub, and coastal prairie. March – June	**No Potential.** This species is not expected as there is no suitable habitat on site.
Hairless popcornflower *Plagiobothrys glaber*	--	--	1A	Coastal salt marshes and alkaline meadows. March – May	**No Potential.** This species is not expected as there is no suitable habitat on site. This species is presumed extirpated in California.
Oregon polemonium *Polemonium carneum*	--	--	2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. April – September	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
San Francisco campion *Silene verecunda ssp. verecunda*	--	--	1B.2	Mudstone, shale, or serpentine substrates in coastal scrub, coastal prairie, chaparral and valley and foothill grassland. March – June	**No Potential.** The Irish Hill portion of the Project Site provides marginal serpentine habitat for this species. Some of the known occurrences of this species are located in disturbed, weedy habitats, and thus the high level of historic disturbance would not preclude this species. Rare plant surveys of Irish Hill in 2016 were negative for this species.
Santa Cruz microseris *Stebbinsoseris decipiens*	--	--	1B.2	On sandstone, shale or serpentine derived seaward facing slopes in broadleaf upland forest, closed-cone coniferous forest, chaparral, coastal prairie, and coastal scrub. April – May	**No Potential.** The Irish Hill portion of the Project Site provides marginal serpentine habitat for this species. Some of the known occurrences of this species are located in disturbed, weedy habitats, and thus the high level of historic disturbance would not preclude this species. Rare plant surveys of Irish Hill in 2016 were negative for this species.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Coastal triquetrella *Triquetrella californica*	--	--	1B.2	This moss grows on coastal bluffs and in coastal scrub habitats.	**No Potential.** This species is not expected as there is no suitable habitat on site.
San Francisco owl's clover *Triphysaria floribunda*	--	--	1B.2	Grasslands. April – June	**No Potential.** This species is not expected as there is no suitable habitat on site. A nearby CNDDB occurrence in Potrero has been extirpated.
Locally Significant Species					
Menzies' fiddleneck *Amsinckia menziesii*	--	--	LS	Valley grassland. March - May	**No Potential.** This species is not expected as there is no suitable habitat on site.
Yellow carpet *Blennosperma nanum*	--	--	LS	Valley grassland, foothill woodland, and wetland-riparian areas. Often associated with vernal pool communities. February – April	**No Potential.** This species is not expected as there is no suitable habitat on site.
California larkspur *Delphinium californicum*	--	--	LS	Foothill woodland and mixed conifer forest. April – June	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Coast larkspur *Delphinium decorum*	--	--	LS	Northern coastal scrub, coastal prairie, yellow pine forest and mixed evergreen forest. March - July	**No Potential.** This species is not expected as there is no suitable habitat on site.
Rough leaf aster *Eurybia radulina*	--	--	LS	Foothill woodland and mixed conifer forest. July – October	**No Potential.** This species is not expected as there is no suitable habitat on site.
Big squirrel tail grass *Elymus multisetus*	--	--	LS	Evergreen forests, foothill woodland, chaparral and valley grassland. May – July	**No Potential.** This species is not expected as there is no suitable habitat on site.
Leafy daisy *Erigeron foliosus*	--	--	LS	Evergreen forests, oak woodland, foothill woodland, coastal sage scrub, coastal strand, and Joshua Tree woodland. May – September	**No Potential.** This species is not expected as there is no suitable habitat on site.
California fescue *Festuca californica*	--	--	LS	Mixed evergreen forest and chaparral. February – April	**No Potential.** This species is not expected as there is no suitable habitat on site.
Nuttall's bedstraw *Galium porrigens*	--	--	LS	Forest, coastal scrub, and chaparral. February – April	**Low.** This species is not expected due to marginal habitat found on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Purple spot gilia *Gilia clivorum*	--	--	LS	Valley grassland, northern coastal scrub, foothill woodland, ands mixed evergreen forest. February - June	**No Potential.** This species is not expected as there is no suitable habitat on site.
Hill star *Lithophragma heterophyllum*	--	--	LS	Northern oak woodland and foothill woodland.	**No Potential.** This species is not expected as there is no suitable habitat on site.
Greene's saxifrage *Micranthes californica*	--	--	LS	Coastal sage scrub, closed-cone pine forest, red fir forest, foothill woodland and chaparral.	**No Potential.** This species is not expected as there is no suitable habitat on site.
Skunkweed *Navarretia squarrosa*	--	--	LS	Mixed evergreen forest, northern oak woodland and foothill woodland.	**No Potential.** This species is not expected as there is no suitable habitat on site.
Bitter cherry *Prunus emarginata*	--	--	LS	Evergreen forests. April – May	**No Potential.** This species is not expected as there is no suitable habitat on site.
Holly leaf cherry *Prunus ilicifolia*	--	--	LS	Chaparral and foothill woodland. February – April	**No Potential.** This species is not expected as there is no suitable habitat on site.
Chokecherry *Prunus virginiana* var. *demissa*	--	--	LS	Chaparral, yellow pine forest, foothill woodland and wetland and riparian areas. March – May	**No Potential.** This species is not expected as there is no suitable habitat on site.

Table E-1. Special-Status or Otherwise Protected Plant Species That May Occur in the Study Area*

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR Ranking**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
Canyon gooseberry *Ribes menziesii*	--	--	LS	Redwood forest, mixed evergreen forest and chaparral. January – March	**No Potential.** This species is not expected as there is no suitable habitat on site.
Wood rose *Rosa gymnocarpa*	--	--	LS	Yellow pine forest, foothill woodland, chaparral and valley grassland. May – June	**Low.** This species is not expected as there is no suitable habitat on site and species was not observed during botanical surveys.
California groundsel (Rayless ragwort) *Senecio aronicoides*	--	--	LS	Chaparral, yellow pine forest, red fir forest, lodgepole forest, and sagebrush scrub. April – July	**Low.** This species is not expected as there is no suitable habitat on site and species was not observed during botanical surveys.
Simple campion *Silene scouleri* ssp. *scouleri*	--	--	LS	Northern coastal scrub. July – August	**No Potential.** This species is not expected as there is no suitable habitat on site.

Notes:
*The project study area for terrestrial biological resources includes the project site and landside areas adjacent to the project site with similar habitat composition that includes developed or paved areas with long-standing industrial uses.

The "Potential for Effect" category is defined as follows:
Present = Species was observed during reconnaissance or focused surveys of the project area.
High = Species is expected to occur, habitat meets species requirements and is of moderate or high quality, and the study area is within the known species range.
Moderate = Habitat is marginally suitable (i.e. of low or moderate quality) or the study area is within the known range of the species, even though the species was not observed during biological surveys.

Notes (Continued):
Low = Habitat does not meet species requirements as currently understood in the scientific community or the site is not within a species' geographic range.
No Potential = Habitat does not meet species requirements or the species is presumed to be extirpated from the project area or region based on the best scientific information available.

FESA = Federal Endangered Species Act, CESA = California Endangered Species Act,
CNDDB = California Natural Diversity Database

STATUS CODES:

Federal: U.S. Fish and Wildlife Service (USFWS)
FE = Listed as "endangered" under the FESA
FT = Listed as "threatened" under the FESA
FPD = Proposed delisted
FD = Delisted

State: California Department of Fish and Wildlife (CDFW)
CE = Listed as "endangered" under the CESA
CT = Listed as "threatened" under the CESA
CSC = CDFW designated "species of special concern"
CFP = CDFW designated "fully protected"
SC = CDFW designated "candidate threatened"
WL = CDFW designated "watch list"

California Rare Plant Rank (CRPR):
Rank 1A = Plants presumed extirpated in California and either rare or extinct elsewhere.
Rank 1B = Plants rare, threatened, or endangered in California and elsewhere.
Rank 2A = Plants presumed extirpated in California, but more common elsewhere.
Rank 2B = Plants rare, threatened, or endangered in California, but more common elsewhere.
Rank 3 = Plants about which we need more information – a review list
Rank 4 = Plants of limited distribution – a watch list

An extension reflecting the level of threat to each species is appended to each rarity category as follows:
.1 – Seriously endangered in California.
.2 – Fairly endangered in California.
.3 – Not very endangered in California.

LS = Locally Significant Plant Species for San Francisco County as designated by the CNPS Yerba Buena Chapter

Source: USFWS, 2015; CNDDB, 2015; CDFW, 2015b; CNPS, 2015a; CNPS, 2015b.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
SPECIES LISTED OR PROPOSED FOR LISTING				
Invertebrates				
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE	--	Coastal scrub or grassland on rocky outcrops with broadleaf stonecrop (*Sedum spathulifolium*).	**Low.** Three known populations occur at San Bruno Mountain, Montara, and Pacifica. While rocky outcrops occur on Irish Hill, vegetation is dominated by non-native and invasive species; host plant not observed during rare plant surveys and therefore this species is not expected on site.
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT	--	Serpentine grasslands with larval host plants dwarf plantain (*Plantago erects*) and purple owl's clover (*Castilleja exserta spp. exerta*).	**No Potential.** While Irish Hill may contain serpentine soils, vegetation is dominated by non-native and invasive species; host plant not observed during rare plant surveys and therefore this species is not expected on site.
Mission blue butterfly *Plebejus icarioides missionensis*	FE	--	Grassland with *Lupinus albifrons*, L. Formosa, and L. varicolor.	**No Potential.** The only undeveloped areas in the Project Site are highly disturbed and dominated by non-native and invasive species. Host plants not observed during rare plant surveys; therefore this species is not expected on site.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
Callippe silverspot butterfly *Speyeria callippe callippe*	FE	--	Found in native grasslands with *Viola pedunculata* as larval food plant.	**No Potential.** Although a CNDDB occurrence occurs 2.8 miles to the south, host plants were not observed during the rare plant surveys and site conditions are not conducive to supporting host plants; therefore this species is not expected on site.
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	FE	*	Host plants include Grindelia hirsutula, Abronia latifolia, Mondardella, Cirsium vulgare, Erigeron glaucus where found on the San Francisco and Marin peninsulas.	**No Potential.** The only undeveloped areas in the Project Site are highly disturbed and dominated by non-native and invasive species. Host plants not observed during rare plant surveys and site conditions are not conducive to supporting host plants; therefore this species is not expected on site
Reptiles				
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE	CE, CFP	Densely vegetated ponds near open hillsides with abundant small mammal burrows.	**No Potential.** This species is considered likely extirpated from San Francisco. No suitable habitat occurs in or near the study area; therefore this species is not expected on site.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
Amphibians				
California red-legged frog *Rana draytonii*	FT	CSC	Freshwater ponds and slow streams with emergent vegetation for egg attachment.	**No Potential.** No suitable breeding or upland dispersal habitat occurs in or near the project site; therefore this species is not expected on site.
Birds				
Marbled murrelet *Brachyramphus marmoratus*	FT	CE	Breeds in coniferous forests near the coast with an affinity to old growth, mature stands. Nests on large horizontal branches high in the trees. Winters at sea.	**Low (No nesting potential).** May feed offshore of the study area in winter months.
Western snowy plover *Charadrius alexandrinus nivosus*	FT	CSC	Sandy beaches, salt pond levels and shores of alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Low (No nesting potential).** The shoreline is armored with riprap and the surrounding area is developed. Minimal beach foraging habitat is available onsite to attract this species.
American peregrine falcon *Falco peregrines anatum*	FD	CFP	Woodlands, coastal habitats, riparian areas, coastal and inland waters, human made structures that may be used as nest or temporary perch sites.	**Moderate (Potential to nest).** There are no adequate natural features for this species; however, the onsite buildings may provide potential nest sites. May hunt birds above the study area.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
Bald eagle *Haliaeetus leucocephalus* (nesting and wintering)	FD	CE, CFP	Nests and forages on inland lakes, reservoirs, and rivers.	**Low (No nesting potential).** Unlikely to nest in an urban environment lacking nesting habitat. May forage for fish in the San Francisco Bay and scavenge for carcasses on the shoreline.
California black rail *Laterallus jamaicensis coturniculus*	--	CT	Salt and brackish marshes; also in freshwater marshes at low elevations.	**No Potential.** No suitable habitat present in the study area.
Brown pelican Pelecanus occidentalis californicus	FD	CFP	Pelagic forager along ocean and bay shorelines whose breeding range extends from the Channel Islands south to Mexico.	**Present (No nesting potential).** Forages in the San Francisco Bay.
Short-tailed albatross *Phoebastria (=Diomedea) albatrus*	FE	CSC	A pelagic species that spends most of its time at sea and returns to land only for breeding purposes.	**Low Potential (No nesting potential).** Breeds only at one or two sites off the coast of Japan, occasional visitor to California coast and could appear on a transient basis offshore of the study area.
Ridgway's rail *Rallus obsoletus obsoletus*	FE	CE, CFP	Salt marsh wetlands with dense vegetation along the San Francisco Bay.	**No Potential (No nesting potential).** A recent CNDDB occurrence is documented nearby (1.5 miles south). Suitable habitat is not present within the study area and the species is not

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
				known to travel long distances; therefore this species is not expected on site.
Bank swallow *Riparia riparia (nesting)*	--	CT	Vertical banks and cliffs with sandy soil, near water. Nests in holes dug in cliffs and river banks.	**Low (No nesting potential).** No suitable nesting habitat in the study area. Species may occur on a transient basis while foraging.
California least tern *Sterna antillarum browni*	FE	CE	Open beaches free of vegetation along the California coast.	**Low (No nesting potential).** Forages near the Bay shoreline. The Project Site shoreline is nearly completely armored with riprap and is bounded by paved, active parking lots. Nesting sites are not known to the study area. Closest nesting site is located on Alameda NAS, and it is unlikely this species would travel as far as the Project Site for foraging.
OTHER SPECIAL-STATUS SPECIES				
Invertebrates				
Monarch butterfly *Danaus plexippus*	--	*	Eucalyptus groves (wintering sites).	**Low.** Several records of this species in Golden Gate Park but no wintering sites have been identified within the study area. Few eucalyptus trees are located at the base of Irish Hill and individuals may occur during

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
				migration; however, the eucalyptus trees are not abundant and protected enough to support a roosting colony.
Tomales isopod *Caecuditea tomalensis*	--	--	Still to slow-moving water in vegetated ponds, preferably spring-fed.	**No Potential.** No suitable habitat present in the study area; therefore this species is not expected on site.
Reptiles				
Western pond turtle *Emys marmorata*	--	CSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	**No Potential.** No freshwater habitat on or near the study area; therefore this species is not expected on site.
Birds				
Tricolored blackbird *Agelaius tricolor*	--	CSC	Nests in dense colonies within sloughs, swamps, and marshes where tall aquatic vegetation is present. Nests can extend into upland scrub habitat on colony fringes.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area. May occur on a transient basis during migration.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
Great blue heron *Ardea herodias*	--	§3503	Shallow estuaries and fresh and saline emergent wetlands.	**Moderate (No nesting potential).** May forage along the study area shoreline. No existing rookeries occur within the study area; therefor this species is not expected to nest on site.
Short-eared owl *Asio flammeus*	BCC	CSC	Open, flat, treeless terrain. Marshes, grasslands, or fields.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely developed; therefore this species is not expected on site.
Western burrowing owl *Athene cunicularia*	BCC	CSC	Open grasslands with low or no vegetation where existing rodent burrows occur for occupation.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely developed. Ruderal vegetation within the Project Site (tall fennel) does not provide habitat elements preferred by this species; therefore this species is not expected on site.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
Oak titmouse *Baeolophus inornatus*	BCC	§3503	Open, dry oak woodlands.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely developed and lacks oak trees; therefore this species is not expected on site.
Great horned owl *Bubo virginianus*	--	§3503.5	Riparian, coniferous, chaparral and desert habitats.	**Moderate (Potential to nest).** Large eucalyptus trees in the study area could support nests for this species.
Red-tailed hawk *Buteo jamaicensis*	--	§3503	Found in nearly all habitats and elevations.	**Moderate (Potential to nest).** Large eucalyptus trees in the study area could support nests for this species.
Red-shouldered hawk *Buteo lineatus*	--	§3503	Riparian woodlands with swamps and emergent wetlands.	**Moderate (Potential to nest).** Large eucalyptus trees in the study area could support nests for this species.
Red knot *Calidris canutus ssp. roselaari*	BCC	§3503	Shoreline mudflats and beaches.	**Low (No nesting potential).** Uncommon winter migrant that could occur on mudflats beyond the study area.
Olive-sided flycatcher *Contopus cooperi*	BCC	CSC	Forest and woodland habitats.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
				developed. Conifer species preferred by this species do not occur within the study area; therefore this species is not expected on site.
San Francisco common yellowthroat *Geothlypis trichas sinuous*	BCC	CSC	Forages in various marsh, riparian and upland habitats. Nests on or near the ground in concealed locations.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely developed and lacks riparian vegetation; therefore this species is not expected on site.
California gull *Larus californicus*	--	WL, §3503	Colonial nester, sometimes with other bird species. Breeds primarily at lakes and marshes in interior western North America from Canada south to eastern California and Colorado. Birds that breed inland are migratory, most moving to the Pacific coast in winter.	**Present (Potential to nest).** Breeds in large numbers at the salt ponds of south San Francisco Bay. Known to nest on roofs in the study area and could nest on warehouse roofs of the Project Site. May forage off-shore of the study area.
Western gull *Larus occidentalis*	--	§3503	Colonial nester on offshore islands or piers, sometimes with seabirds.	**Present (Potential to nest).** Breeds in San Francisco Bay. May forage off-shore of the study area and nest on building roofs of the study area and the dilapidated offshore pier

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
				northeast of the Project Site. Previous nesting sites documented at Pier 60 and 64 north of the study area[2].
Short-billed dowitcher *Limnodromus griseus*	BCC	§3503	Saltwater tidal flats, beaches, and salt marshes during migration.	**Low (No nesting potential).** Common winter migrant that could occur on mudflats of the study area.
Marbled godwit *Limosa fedoa*	BCC	§3503	Shoreline mudflats and beaches.	**Low (No nesting potential).** Common winter migrant that could occur on mudflats of the study area.
Alameda song sparrow *Melospiza melodia pusillula*	--	CSC	Salt marshes of eastern and south San Francisco Bay.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely developed and saltmarsh vegetation required by this species; therefore this species is not expected on site.
San Pablo song sparrow *Melospiza melodia samuelis*	--	CSC	Salt marshes of eastern and north San Francisco Bay.	**No Potential (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely

[3] Golden Gate Audubon Society and San Francisco Bay Bird Observatory, 2009. *Summary Report of Avian Surveys Conducted in 2008 at Dilapidated Piers and Other Structures along the Port of San Francisco's Southern Waterfront Properties*. Prepared by Noreen Weeden and Michael Lynes, September 23.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
				developed and saltmarsh vegetation required by this species; therefore this species is not expected on site.
Long-billed curlew *Numenius americanus*	BCC	WL, §3503	Breeds in upland shortgrass prairies and wet meadows in northeastern California in gravelly soils.	**Low (No nesting potential).** May be a winter visitor to mudflats of the study area.
Whimbrel *Numenius phaeopus*	BCC	§3503	Saltwater tidal flats, beaches, and salt marshes during migration.	**Low (No nesting potential).** Common winter migrant that could occur on beaches and mudflats of the study area.
Osprey *Pandion haliaetus*	--	WL, §3503	Habitat varies greatly and usually includes adequate supply of accessible fish, shallow waters, open and elevated nest sites (10-60 feet in height), and artificial structures such as towers. Builds large platform stick nests near or in open waters.	**Moderate (Potential to nest).** Known to forage in San Francisco Bay and recently nest at Pier 80. Towers adjacent to the south of the Project Site provide potential nesting sites for this species.
Double-crested cormorant *Phalacrocorax auritus*	--	WL, §3503	Rookery breeder in coastal areas and inland lakes in fresh, saline, and estuarine waters.	**Present (Potential to nest).** Abundant in San Francisco Bay. May forage off-shore of the study area and nest on the dilapidated offshore pier northeast of the Project Site.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
Nuttall's woodpecker *Picoides nuttallii*	BCC	§3503	Oak and riparian woodlands.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely developed and lacks riparian vegetation and oak woodlands; therefore this species is not expected on site.
Allen's hummingbird *Selasphorus sasin*	BCC	§3503	Brush and woodlands.	**Low (Potential to nest).** May forage on fennel and eucalyptus of the Project Site.
Yellow warbler *Setophaga petechia*	BCC	CSC	Nests in dense riparian cover and montane chaparral. Breeding distribution includes coast ranges and western slopes of the Sierra Nevada. Rare to uncommon in lowland areas.	**Low (No nesting potential).** No suitable nesting or foraging habitat is present in the study area that is almost entirely developed and lacks riparian vegetation; therefore this species is not expected on site.
Lawrence's goldfinch *Spinus lawrencei*	BCC	§3503	Open woodlands, chaparral near fields for foraging seeds.	**Low (No nesting potential).** Uncommon to San Francisco. Could occur on a transient basis and forage on fennel of the Project Site.
Caspian tern *(Sterna caspia)*	BCC	*	Nests on shorelines and feeds on fish and crustaceans in open water or shorelines.	**Present (Potential to nest).** Breeds in San Francisco Bay. May forage off-shore of the study area and nest on the

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
				dilapidated offshore pier northeast of the Project Site. Previous nesting sites documented at Pier 60 and 64 north of the study area[3].
Barn owl *Tyto alba*	--	§3503.5	Open areas including chaparral, grassland, riparian, wetlands.	**Moderate (Potential to nest).** Could forage over ruderal habitat within the study area and nest in open rafters of Project Site warehouses.
Mammals				
Pallid bat *Antrozous pallidus*	--	CSC, WBWG: High	Prefers caves, crevices, hollow trees, or buildings in areas adjacent to open space for foraging. Associated with lower elevations in California.	**Moderate.** Suitable roosting habitat for this species is available within buildings of the Project Site.
Townsend's big-eared bat *Corynorhinus townsendii*	--	CSC, SC, WBWG: High	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings of rocky areas with caves or tunnels. Roosting sites limited. Extremely sensitive to human disturbance.	**Low.** Suitable roosting habitat for this species is available within buildings of the Project Site; however high levels of human disturbance may discourage use.

[3] Golden Gate Audubon Society and San Francisco Bay Bird Observatory, 2009. *Summary Report of Avian Surveys Conducted in 2008 at Dilapidated Piers and Other Structures along the Port of San Francisco's Southern Waterfront Properties*. Prepared by Noreen Weeden and Michael Lynes, September 23.

Table E-2. Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area*

Common Name Scientific Name	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area
Western red bat *Lasiurus blossevillii*	--	CSC, WBWG: High	Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	**Low.** The few eucalyptus trees of the Project Site are fairly exposed and are unlikely to support roosting sites for this species that prefers broad-leaved riparian trees.
Hoary bat *Lasiurus cinereus*	--	*, WBWG: Medium	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths; requires water.	**Low.** The few eucalyptus trees of the Project Site are fairly exposed and are unlikely to support roosting sites for this species.
Yuma myotis *Myotis yumanensis*	--	*, WBWG: Low-Medium	Optimal habitats are open forests and woodlands with water sources to feed over. Roosts in buildings, trees, mines, caves, bridges, and rock crevices. Maternity colonies active May through July.	**Moderate.** Suitable roosting habitat for this species is available within buildings of the Project Site.
American badger *Taxidea taxus*	--	CSC	Open grasslands with loose, friable soils.	**No Potential.** No suitable habitat present on site.
Point Reyes jumping mouse *Zapus trinotatus orarius*	--	CSC	Upland areas of bunch grass in marshes in Point Reyes.	**No Potential.** Study area is south of the known range for this species. No suitable habitat is present on site.

Notes:
*The project study area for terrestrial biological resources includes the project site and landside areas adjacent to the project site with similar habitat composition that includes developed or paved areas with long-standing industrial uses.

The "Potential for Effect" category is defined as follows:
Present = Species was observed during reconnaissance or focused surveys of the project area.
High = Species is expected to occur, habitat meets species requirements and is of moderate or high quality, and the study area is within the known species range.
Moderate = Habitat is marginally suitable (i.e. of low or moderate quality) or the study area is within the known range of the species, even though the species was not observed during biological surveys.
Low = Habitat does not meet species requirements as currently understood in the scientific community or the site is not within a species' geographic range.
No Potential = Habitat does not meet species requirements or the species is presumed to be extirpated from the project area or region based on the best scientific information available.

FESA = Federal Endangered Species Act, CESA = California Endangered Species Act,
CNDDB = California Natural Diversity Database

STATUS CODES:

Federal: U.S. Fish and Wildlife Service (USFWS)
FE = Listed as "endangered" under the FESA
FT = Listed as "threatened" under the FESA
FPD = Proposed delisted
FD = Delisted
BCC = Bird of Conservation Concern

State: California Department of Fish and Wildlife (CDFW)
CE = Listed as "endangered" under the CESA
CT = Listed as "threatened" under the CESA
CSC = CDFW designated "species of special concern"
CFP = CDFW designated "fully protected"
SC = CDFW designated "candidate threatened"
WL = CDFW designated "watch list"

Other: Western Bat Working Group (WBWG)
Low = Stable population
Medium = Need more information about the species, possible threats, and protective actions to implement.
High = Imperiled or at high risk of imperilment.

Notes (Continued):
§3503 = Eggs, Nests, and Nestlings Protected under Section 3503 of the California Fish and Game Code
§3503.5 = Eggs, Nests, and Nestlings of Falconiformes and Strigiformes Protected under Section 3503.5 of the California Fish and Game Code
* = California special animal

Source: USFWS, 2015; CNDDB, 2015; CDFW, 2015a; eBird, 2015.

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
Sacramento River winter-run ESU Chinook salmon *Oncorhynchus tshawytscha*	FE/-	CE	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay-Delta to freshwater spawning grounds	**Low.** No foraging of spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the Project site. There is a low potential for incidental occurrence of this species if individuals are lost or swept into the area by currents.	Adults - November and December Juveniles – fall and winter
Central Valley spring-run ESU Chinook salmon *O. tshawytscha*	FT/-	CT	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay-Delta to freshwater spawning grounds	**Low.** No foraging of spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the Project site. There is a low potential for incidental occurrence of this species if individuals are lost or swept into the area by currents.	Adults - late winter to spring Juveniles - fall though spring

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
Central Valley fall-run/late fall-run Chinook salmon *O. tshawytscha*.	FSC/-	-	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from Ocean through San Francisco Bay-Delta to freshwater spawning grounds	**Low.** No foraging of spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the Project site. There is a low potential for incidental occurrence of this species if individuals are lost or swept into the area by currents.	Adults - June through September Juveniles - winter through summer
Central California coast ESU Coho salmon *Oncorhynchus kisutchs*	FE/-	CE	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay-Delta to freshwater spawning grounds	**No Potential. Although historically present in San Francisco Bay,** Coho salmon are currently considered extirpated from San Francisco Bay.	Not Applicable
Central Valley DPS steelhead trout *O. Mykiss*	FT/-	-	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay-Delta to freshwater spawning grounds	**Low.** No foraging or spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the aquatic Study	Adults - winter and spring Juveniles - year-round

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
				Area. There is a low potential for incidental occurrence of this species if individuals are lost or swept into the area by currents.	
Central California coast DPS steelhead trout *O. mykiss*	FT/-	CSC	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from Ocean through San Francisco Bay-Delta to freshwater spawning grounds	**Low.** No foraging or spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the aquatic Study Area. There is a low potential for incidental occurrence of this species if individuals are lost or swept into the area by currents.	Adults - winter Juveniles – year-round
Green Sturgeon (Southern DPS) *Acipenser medirostris*	FT/-	CSC	Marine and estuarine environments and Sacramento River; All of San Francisco Bay-Delta	**High.** This species may forage in or near the Project area.	year-round

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
Tidewater goby *Eucyclogobius newberryi*	FE/-	CSC	Coastal lagoons, estuaries, and marshes in coastal California from the Smith River (Del Norte County) to Aqua Hedionda Lagoon (San Diego County)	**No Potential.** Species presumed to be extirpated from San Francisco Bay-Delta.	Not Applicable.
Delta smelt *Hypomesus transpacificus*	FT/-	CE	Sacramento-San Joaquin Delta, Suisun Bay, San Pablo Bay, river channels and sloughs in Delta	**No Potential.** Outside of known species range.	Not Applicable.
Longfin smelt *Spirinchus thaleichthys*	FC/-	CT	Throughout the nearshore coastal waters and open waters of San Francisco Bay- Delta including the river channels and sloughs of the Delta	**Moderate.** This species is documented to inhabit the deep channels of Central Bay for most of the year, including the waters adjacent to the Project Site.	Year-round
Pacific harbor seal *Phoca vitulina richardsii*	-/P	-	Coastal waters, and throughout Bay-Delta	**High.** Species frequents the waters of the San Francisco shoreline. .	Year-round

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
California sea lion *Zalophus californianus*	-/P	-	Coastal waters, and throughout Bay-Delta	**Low-Moderate.** Species frequents the waters of the San Francisco shoreline, predominantly in west Central Bay, but will forage throughout the Bay.	Year-round
Harbor porpoise *Phocoena phocoena*	-/P	-	An inshore species inhabiting shallow, coastal waters and occasional large rivers, including San Francisco Bay-Delta	**Low.** The resident population has been steadily increasing in numbers and extending its foraging range within the Bay beyond the waters between the Golden Gate and Alcatraz Island. Observations have been made as far north as the Napa River mouth to the north and the Oakland-San Francisco Bay Bridge to the south.	Year-round
Northern Elephant Seal *Mirounga angustirostris*	-/P	-	Northern elephant seals are the largest phocid, or "true" seal, in the Northern Hemisphere. They are found in the	**Low.** Occurrence and presence within Central Bay has steadily increased over recent years with individuals	Primarily April to August with occasional occurrences in October and November. Not known to be present

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
			eastern and central North Pacific Ocean. They range as far north as Alaska and as far south as Mexico, with established Central California breeding colonies on the Farallon Islands, at Año Nuevo State Park, and near San Simeon, California. In recent years, young -of-the-year individuals have been observed hauling out on the sandy beach at Crissy field.	entering the Bay on an annual basis. Additionally, its presence beyond the Central Bay waters between the Golden Gate and Alcatraz Island is also increasing with recent occurrences in North Bay. No sightings in south Central Bay have been reported as yet.	beyond the western segment of Central Bay.
Bottlenose Dolphin *Tursiops truncatus*	-/P	_	Found along the California coastline, bottlenose dolphins segregate into coastal or oceanic ecotypes with the coastal ecotype inhabiting waters within 1- Kilometer of shore normally between Baja, California and Point	**Low.** Documented Central Bay presence is currently limited to waters between the Golden Gate and Alcatraz Island; individuals are capable of foraging over a larger area if prey fish are present.	Potentially Year-round

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
			Conception. During El Niño events and in recent years, bottlenose dolphins have been observed as far as San Francisco Bay with individuals making occasional forays to the Golden Gate.		
Southern Sea Otter *Enhydra lutris*	-/P	_	Nearshore environments between Santa Barbara and Half Moon Bay. Although historic inhabitants of San Francisco Bay prior to being hunted to near extinction, occasional sightings of otters within the Bay occur.	**Low.** Species is an infrequent visitor to San Francisco Bay and historically have limited their visitations to the waters between the Golden Gate and Alcatraz Island, including Richardson Bay.	Potentially Year-round

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			
Gray whale *Eschrichtus robustus*	FDL/P	-	Predominantly coastal waters, although occasional individuals enter the Bay-Delta and have been observed swimming up the Sacramento River and into the South Bay.	**Low.** Species is an infrequent visitor to San Francisco Bay.	December to April, during migration from Alaska to Baja California, occasionally enter Bay-Delta, transient
Humpback whale *Megoptera noveangli*	FE/FD	-	Predominantly coastal waters, although occasional individuals enter the Bay-Delta	**Low.** Species is an infrequent visitor to San Francisco Bay.	April to December, during migration, occasionally enter the Bay-Delta, transient

Notes:

The "Potential for Occurrence within the Project Area" category is defined as follows:
High = Suitable foraging or spawning/rookeries/birthing habitat is present and/or the species has been documented to be present throughout the year and/or in substantial numbers.
Moderate = Suitable foraging or spawning//rookeries/birthing habitat is present and/or the species has been documented to be present for part of the year
Low = Suitable foraging or spawning/rookeries/birthing habitat is present, but the species has either not been documented to be present or if present, the presence is infrequent.
No Potential = Suitable foraging or spawning/rookeries/birthing habitat is not known to be present and the species has not been documented to occur.

FESA = Federal Endangered Species Act, MMPA = Marine Mammal Protection Act, CESA = California Endangered Species Act

Table E-3. Special-Status Fish and Marine Mammal Species that May Occur within the Bay Waters of the Project Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Area	Time Period Present in Project Area Waters
	Federal FESA/ MMPA	State CESA			

Notes (Continued):
STATUS CODES:

Federal: U.S. Fish and Wildlife Service (USFWS)
FDL = Delisted
FE = Listed as "endangered" (in danger of extinction) under FESA
FT = Listed as "threatened" (likely to become Endangered within the foreseeable future) under FESA
FC = Candidate to become a proposed species
FSC = Former "federal species of concern". The USFWS no longer lists Species of Concern but recommends that species considered to be at potential risk by a number of organizations and agencies be addressed during project environmental review. *NMFS still lists "Species of Concern".

Federal: National Oceanographic and Atmospheric Administration (NOAA) MMPA
FD = Depleted Population
P = Federally Protected

State: California Department of Fish and Wildlife (CDFW)
CE = Listed as "endangered" under the CESA
CT = Listed as "threatened" under the CESA
CSC = CDFW designated "species of special concern"

Sources: Bartling 2006; Bay Institute 2007; NMFS 2005, NOAA 2015; NOAA 2009; Sommer and Mejia 2013, USFWS 2013.

Table E-4. Managed Fish Species Known to Occur in San Francisco Bay under the Magnuson-Stevens Act

Fisheries Management Plan	Common Name	Scientific Name	Life Stage	Abundance
Coastal Pelagic	Northern anchovy	Engraulis mordax	J, A	Abundant
	Jack mackerel	*Trachurus symmetricus*	E, L	Present
	Pacific Chub Mackerel	*Scomber japonicus*	J, A	Present
	Pacific sardine	*Sardinops sagax*	J, A	Present
Pacific Groundfish	**English sole**	*Parophrys vetulus*	J, A	Abundant
	Sand sole	*Psettichthys melanostictus*	L, J, A	Present
	Curlfin sole	*Pleuronichthys decurrens*	J, A	Present
	Pacific sanddab	*Citharichthys sordidus*	E, L, J, A	Present
	Starry flounder	*Platichthys stellatus*	J, A	Present
	Lingcod	*Ophiodon elongatus*	E, L, J, A	Present
	Brown rockfish	*Sebastes auriculatus*	J	Present
	Blue Rockfish	*Sebastes melanostomus*	L, J, A	Present
	China Rockfish	*Sebastes nebulosus*	E, L, J, A	Present
	Pacific whiting (hake)	*Merluccius productus*	E, L	Rare
	Kelp greenling	*Hexagrammos decagrammus*	E, L, J, A	Present
	Leopard shark	*Triakis semifasciata*	J, A	Present
	Spiny dogfish	*Squalus acanthias*	J, A	Present
	Skates	*Raja* ssp.	J, A	Present
	Soupfin shark	*Galeorhinus galeus*	J, A	Rare
	Bocaccio	*Sebastes paucispinis*	L, A	Rare
	Cabezon	*Scorpaenichthys marmoratus*	J	Rare
	Chinook salmon	*Oncorhynchus tshawytscha*	J, A	Seasonally Present
Pacific Coast Salmonids	Coho salmon	*Oncorhynchus kisutch*	J, A	Historically Present, Current Occurrence unknown

Notes: A = Adult J = Juvenile L = Larvae E = Egg
Bolded common names indicate species that have been documented to inhabit the study area.

APPENDIX F: HAZARDS AND HAZARDOUS MATERIALS

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DRAFT PHASE I ENVIRONMENTAL SITE ASSESSMENT

Pier 70 Waterfront Site
San Francisco, California

Prepared by

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Project Number WR1518

November 2011

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Eastern Portion of Site

This area is comprised of historical Buildings 11 and 21, a yard area used by Somarts, and parking areas used by Affordable Self-Storage and Auto Return. Sims Metal is located in the northern portion of this area and a radio tower is present to the west of Sims Metal. This was the first area of the Site to be to be developed, in 1866, by Pacific Rolling Mills followed by The Risdon Iron & Locomotive Company (1900 – 1911), a subsidiary of the U. S. Steel Corporation /Union Iron Works purchased the Site in 1912 and leased the area to the government who built and operated a United States destroyer plant. In approximately 1940, the U.S Navy purchased the plant and built an entirely new shipyard. Many of these structures were demolished between 1977 and 1982.

Note: Current Buildings/Areas are provided in bold; former buildings/ areas are not bold.

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
Building 21 (Substation#5) and former Building 55 (Marine Machinist)	Located just west of Building 11, surrounded by two paved roads, to the north and west, and a paved lot to the south and southeast.	Two-story structure measuring 101'-2" long by 75'-6" wide by 44' high. It is a steel frame structure with corrugated metal cladding and contains 10,172 square-feet. A shed-roofed building attaches to this elevation at the southeast corner (former Building 55)	This building dates to the Risdon Iron Works period (c. 1900). Sanborn Maps through 1975 are labeled as a machine shop and transformer house. A 1945 Bethlehem Steel Company describes Building 21 as sub-station no. 5 and electric shop no.2. It is described as a government owned building; the owner prior to 1941 is shown as Columbia Steel Co. (U. S. Steel Corp.) In 1945, the western half of the building had a compressor, small electric parts room, and transformers with the eastern portion used as an electrical shop, with a small office in the northeast part of the floor. The second floor housed a shop in the	Shed on southeastern corner labeled as Marine Machinist. Forges were present in this area from 1887-1900 (1). 1981 cleanup of PCBs at the Building. Old leaking transformers containing PCBs were removed (referred to as operational area 1) Walls, floors, and asphalt driveways were sampled with wipes. PCB (Arochlor 1260) results before cleanup ranged from 17 to 5,888 ug/wipe in operational area 1, Samples taken from the floor area (asphalt floor) ranged from non-detect to 62 parts per million (ppm). After	Building 21 now functions as an electrical substation for the Pier 70 site and for the transmitter and storage for the radio tower. A utility trench is present to the north of the Building and is covered with steel plates. Door to shed-roofed building is labeled "Convoy Company"

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Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
			north portion and a store room in the south.	decontamination, confirmation samples were taken in operational area 1 ranged from 4 to 80 ug/wipe, and. The asphalt confirmation samples were all within residential cleanup levels (Aroclor 1260 was 220 ug/wipe area for residential 1,000 ug/wipe area for industrial) In 2001, east wing was used for furniture manufacturing operation and moving van storage and west side was used for storage of electrical supplies. (3) A SCA Report Summary dated May, 2008 compiled available information on asbestos containing building materials (ACMs), lead based paint, PCBs and mercury switches indicated that Building 21 contained both ACMs and lead based paint.	
Somarts Area and area directly south of Somarts area	Located to the south of Building 21	Former Building 20 was present in this location in 1944 and was labeled as a locker room. A canteen was located	--	Furnaces were present in this area from 1887-1900 (1)	Somarts has small quantities of paints and cleaners stored in a flammable storage

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		to the west of the locker room and a welding platform was adjacent to the south.			cabinet and work-shop container.
Building 11 (Tool Room and Office/Noonan Building)	Building 11 stands just east of Building 21and west of a paved parking lot.	Located on the location of the Pacific Rolling Mills sheet and tin plate warehouse, Building 11 was built in 1941 by the Navy as part of the New Yard to aid in production related to World War II. A three-story, rectangular wood frame structure is 156' long by 72' wide by 38' high, and contains a total of 32,664 square-feet. It is clad with horizontal wood siding.	Building 11 provided support for hull construction at the Building 12 Complex.	The first floor originally contained a tool room, temporary lights department, and "burner department, as well as offices. The two upper floors were devoted to office space. 1959 Sanborn shows first floor was a cafeteria. Housed artists and photographers studios in 2001 A SCA Report Summary dated May, 2008 compiled available information on asbestos containing building materials (ACMs), lead based paint, PCBs and mercury switches indicated that building 11 contained both ACMs and lead based paint.	Currently, artist studios and offices occupy the Building. A utility trench is present to the north of the Building and is covered with steel plates.
Radio Tower Area	On the northern portion of the area to the east of the 20th Street access	Approximately one acre with exposed surface soil and small areas of asphalt parking lot.	This area was occupied by former Buildings 4 and 7 (see discussion below). Radio station KEST, 1450 AM, tower is now present. The antenna is	The southern portion of historic Buildings 4 and 7 (see below) were present in this area.	This area was unpaved with piles of concrete debris. Dirt was mounded in the area. There was an empty roll-off bin

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Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
			located on an unpaved open area and the transmitter is located nearby in a room within Building 21. The transmission line feed goes underground from the room to the 180 foot tower. KEST moved to the site in 1997. (2)		present along the western border.
Former Building No. 4 – Sheet Metal Shop and Welding Shed	Was located in the now vacant radio tower lot to the north of Building 21.	Measured 307'-6" long by 116' wide by 51' tall and totaled 27,235 square feet. Wood and steel building with bitumuls flooring constructed in 1900 and altered in 1917, 1942, and 1943. It was demolished sometime between 1977 and 1982.	Metal bending and machining	Listed as government owned in 1941. A mezzanine was located within the building. Machining equipment included bending rolls, drills, grinders, shears, spot welders, nibblers, and hack saws. An electric muffle furnace was located along the western wall of the mezzanine. The sanitary sewer drain ran along the southern wall. Rail spurs were located directly adjacent to the east and west.	Not applicable – historic
Former Building 7 – Light Warehouse No. 7, Office Annex, and Plastic Annex	Was located in the now vacant radio tower lot to the north of Building 11.	Warehouse No. 7 and Office Annex: Measured 309'-8" long by 81-6' wide by 58' tall and totaled 25,240 square feet. Main Building: Steel and concrete building with concrete flooring constructed in 1926	Warehouse No. 7 and Office Annex: Metal-working mill with office. Plastic Shop: Plastic-working	Warehouse No.7 and Office Annex: Listed as government owned in 1941. Machining equipment included rolling mill and power hack saw. Sewer grating	Not applicable – historic

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Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
		and altered in 1941. Office Annex: Part concrete foundation with wood floor on timber mud sills constructed in 1926 and altered in 1941 Plastic Shop Annex: Measured 31'-3" long by 20'-11" wide by 22' tall and totaled 654 square feet. Wood building with concrete flooring constructed in 1943. It was demolished sometime between 1977 and 1982.		was located near the north-eastern corner. Rail spurs were located within the main building along the eastern edge and directly adjacent to the east and west. Plastic Shop Annex: Sewer grating was located in the center of the shop.	
Sims Metal Area	Located directly to the east of the Radio Tower lot.	Approximately one acre.	This area was occupied by former Buildings 8 and 10 (see discussion below).	Oil storage was present on the southern use boundary in 1914-1950 (1) 2003 Phase 1 by Iris stated that soils excavated during installation of a pump Station and installation of sewer piping adjacent to this area in the late 80s and early 90s were found to contain elevated levels of metals, particularly copper and lead. The report referenced an internal memo on the storage of excavated fill at Pier 70 dated August 24, 1990 that the fill had	Area is all paved and surrounded by a concrete berm to prevent surface water flow off of the site. The facility and operation was orderly and well managed. The facility receives various types of metal debris (cars, appliances, demolition debris, construction waste), sorts the debris according to metal type (e.g., aluminum vs. steel) and then loads the sorted scrap into trucks for further

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Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				levels of methylene chloride at 88 mg/kg and TPH at 10 mg/kg.	processing at other Sims facilities.
Former Building 8 – Riggers Carpentry and Paint Shop and Former Building 10 – Pipe Rack and Locker Room	Was located to the southwest of Building 6	Built in 1941 and government owned. Measured 152-2' long by 92-6' wide by 51' tall and totaled 11,032 square feet. Was constructed of steel wood and concrete and listed as government owned. It was demolished sometime between 1977 and 1982.		Northeast corner of Building contained a varnish room, spray room and mixing area	Not applicable – historic building
Former Building 9 – Pipe Shop No. 2	Was located to the south of Buildings 6 and former Building 57, adjacent to the Bay	Measured 272' long by 92-1' high by 56" tall and totaled 25,014 square feet. Steel and concrete building with concrete flooring constructed in 1941. Stood on redwood and treated Douglas fir pilings. It was demolished sometime between 1977 and 1982.	Metal pipe shop	A brazing area was present along the eastern wall. A magnaflux tester was present on the western wall	Not applicable – historic building. The area is now vacant land with exposed soil at ground surface.
Parking lots south and east of Somarts area and the western Auto Return Parking Lot	Slip 5, 6, 7, and 8 were present on the east and southeast portion of the Site.	Slips 5 and 8 were 400-feet long and Slips 6 and 7 were 660-feet long descending from the shoreline into San Francisco Bay. All were oriented east-west.	Slips 5, 6, 7, and 8 were built in 1941 as part of the Building 12 Complex designed and built by the U. S. Navy. All slips were infilled after 1964 and the associated platforms and cranes were removed. The subsurface portions of the ways may be preserved under an asphalt parking lot. The crane ways and the edge of the ways are visible	1900 Sanborn map shows an 8,000 barrel crude oil tank was located in the current Auto Return eastern parking lot. Historical use in the area prior to 1901 included gas producers, steel works, foundries, squeezers and hammers, crude oil tanks (in	This area is currently used for storage by Affordable Self-Storage and Auto Return. Small leaks from automobiles were present in the Auto Return area; most had been treated with absorbent. Housekeeping was very good.

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Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
			along the shoreline. Two former head house buildings, Buildings 34 and 35, sat at the head of Slips 6 and 7. Rail lines and a semi-gantry crane moved plates and materials from the Building 12 Complex to the slips	addition to the one mentioned above,) a coal shed, coal burner, a blacksmith shop and scrap iron warehouse, and a horse shoe factory. 1959 Sanborn has the southeast corner of the slip area labeled as the sandblast area. Adjacent to the north of Slip No. 5 was the Acetylene Building and Boiler House Building 63 below) Historical use by City Tow/Pick your Part. Area was repaved in when Auto return took over Site. According to the 1990 ERM-West Hazardous Materials Investigation of the Mariposa Facilities, a single boring (B-2) was advanced in this area in support of planned installation of a storm drain line. The boring was located	The terminus end of three steel pipes (approximately 10 inches in diameter) were visible adjacent to the Former Pier 70. The pipes appear to be outfall points for the historic storm water system although their use is unknown.

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Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				approximately 300 feet west of the Bay and along the southern property boundary. Detections of TPH and metals were within the range of concentrations found in other site investigations.	
Former Building 63 – Steam Generating Plant and Welding Platform	Was located north of former slipway 5. Welding platforms were located to the east and west of the building.	49-4" by 40-4' wide by 33' high. 1,990 square feet. Government owned building erected in 1945. Constructed of steel and concrete. It was demolished between 1963 and 1977.	Boiler House	The building housed pumps, a de-aerating heater and an oil pump. An existing steam boiler tank and the planned location of a future tank are pictured to the east of Building 63.	Not applicable – historic building
Former Building 57 – central kitchen	Was located to the southeast of Building 6, adjacent to the Bay and in the area where the new stormwater pump station was constructed.	4,400 square foot wood and concrete building measuring 91" x 66" one story building that was 10-8" high. Erected in 1944. Owned by Bethlehem Steel. It was demolished sometime between 1977 and 1982.	Kitchen	2003 Phase 1 by Iris stated that soils excavated during installation of a pump Station and installation of sewer piping adjacent this area in the late 80s and early 90s were found to contain elevated levels of metals, particularly copper and lead. The report referenced an internal memo on the storage of excavated fill at Pier 70 dated August 24, 1990 that the fill had levels of methylene	Not applicable – historic building. The area is now vacant land with exposed soil at ground surface.

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				chloride at 88 mg/kg and TPH at 10 mg/kg.	
Adjacent Area					
Building 6 (Light Warehouse)	Light Warehouse No. 6 stands in a northwest-southeast orientation along the waterfront at the northeast Site boundary	Built in 1941, on vacant Land and tidal flats, it Was likely designed and built by government personnel as part of the WWII effort. This is a 512' long, 72' wide, 52' high, industrial-vernacular, pile-supported rectangular steel warehouse which occupies 37,128 square-feet. A loading dock covered by a corrugated metal awning spans the western side of the Building.	Warehouse use.	Listed on 1900 Sanborn map as Pacific Rolling Mills Iron storage yard. Rail lines were present near this area as per 1914 Sanborn Map. In 1986, lead and cadmium were found in heavy dust deposits on wall beams and the floor of building 6. Before the 1986 cleanup, composite samples were taken of the floor and wall beam dust. Results showed up to 7,900 mg/kg lead, 21,000 mg/kg zinc, 47 mg/kg cadmium, and 1,300 mg/kg copper. Only lead was above the EPA) Region 9 residential and industrial PRGs of 400 mg/kg and 750 mg/kg, respectively. The dust was removed and the building was decontaminated by high-pressure water scrubbing of the walls, floor, and ceiling.	Building 6 is currently abandoned and vacant. The building was vacant. A BAE Systems materials layout and storage yard is adjacent to the west of the Building
Building 19 (Garage #1)	This building stands	Built in 1941, this is a one-	Garage	Used as a bus	Building contained a

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
	at the end of 20th Street, which was closed during WWII. It is surrounded by open space on the east, west and south elevations.	story, rectangular-plan gable-roofed warehouse with corrugated, galvanized steel roofing and cladding. It measures 50'-8" x 24'-6" in plan and 31'-6" tall, and contains a total of 6,152 square-feet. Rolling metal doors are present on the west, east and south elevations. The north elevation is board-formed concrete and stands higher than the adjacent east and west. A small metal shed attaches to the west elevation.		maintenance and storage yard in 2001 (3) Agency and Port correspondence in 2006 concerning issues with sandblast waste storage and handling. Waste was reportedly hazardous for copper. PCB-Containing transformer storage noted in 1988 Tetra Tech Phase 1.	sifter/conveyor, a bulldozer, and the building stores sandblast grit/waste, used to sandblast ships prior to painting. Ponding was present inside building. A drum next to a secondary containment pallet were present adjacent to the east of the building.
Western Portion of Site					
This area is comprised of historical Buildings 2, the Building 12 Complex, Building 60/ 66/31, a Courtyard area (created by Buildings 113/114, 115/116 and 117, together with Building 14), and a parking area to the west of the Building 12 Complex. Historical Building 2 is currently leased by Paul's Cost Less Warehouse, the Building 12 complex and western parking lot is currently used by Auto Return. The area was first used by the Union Iron Works in 1884. In this area, the steep cliffs of Irish Hill originally created a physical boundary to the south, east and west. The machine, erecting, and smith shops, and the pattern house stood to the south of 20th Street. Of these, only the Pattern House was on-Site. Buildings 113 and 114 (adjacent to the Site) are the only remaining buildings of this original complex. In approximately 1941, the Building 12 Complex, comprising Buildings 12, 15, 16, 25, 32, and 66, was constructed as the central building of the New shipbuilding Yard. The building was designed and built by government (Navy) personnel as part of the joint WWII public-private shipbuilding effort. Note: Current Buildings/Areas are provided in bold; former buildings/ areas are not bold.					
Building/Area	**Location**	**Description**	**Historical Use**	**Additional Details per Historical Information (Information per 1944 As-Builts unless otherwise specified)**	**Current use/ Reconnaissance observations.**
Courtyard area southwest and south of Building 14	Northwest portion of Site.	Courtyard area created by Buildings 113/114, 115/116 and 117, together with	Former Building 112-Pattern Warehouse (below) was present in this area.	Adjacent area to the north was the Building 113 steam-clean area**.**	Currently used for storage. Area to west of Building 14 had

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
		Building 14. The Courtyard is completely paved.		Four USTs were reportedly located east of building 116 and 117, as reported in the TetraTech 1998 Phase I. The first two, a 5,000 gallon and 2,500 gallon tank, were removed in 1990. While analytical data was not found, SFDPH inspector notes indicated a hydrocarbon odor. The second two tanks, a 2,160 gallon and a 576 gallon tank, were closed in place by first cleaning them and then filling them with sand. Except for acetone and methylene chloride, soil samples did not contain detectable levels of TPH, volatile organic compounds, semi-volatile organic compounds or metals.	fenced, bermed, concrete area labeled hazardous waste storage. Treated wood beams were in stockpiles. Racking held lumber and other materials. The adjacent area to the north (adjacent to the south of Building 113) had a dip tank. A small out-of-use tank was present on racking in the area.
Former Building 112 – Pattern House	Was located in the Courtyard area and was oriented in a north-south direction immediately west of Building 14.	Constructed in 1885, demolished in the late 60s or early 70s. Four story industrial loft was 199' long, 49 feet wide and 62" high. Building was constructed of brick walls with a heavy timber frame.	Workers produced patterns or forms for shaping molds used to produce metal castings for machine parts. Pattern makers utilized motorized tools run by a wire line connected to the boiler house in adjacent	A laboratory was present in the southern portion and oil Storage was present to adjacent to the northwest section of the building. 1914 Sanborn map shows a bathroom to the east of the building.	Not applicable – historical structure The area is currently used for storage.

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
			Building 14. Materials for the machine shops and foundries were also stored here.		
Area east of Building 113 and Building 14 and parking lot north of Building 12 complex.	This area consists of the access road to the Courtyard, Building 14 and Building 2 area as well as the Auto Return parking lot located north of Building 21.	Former Building 18, the Accounting Office was present in this area.	--	1914 Sanborn map shows 4,000 barrel fuel oil tank enclosed in 8'brick wall in Building 14 or in this area. Both a TetraTech report from December 1997 and Port records indicate that four underground storage tanks were removed from this area. USTs 104 and 105 were 11,280 gallon USTs that held heating oil. These tanks were removed in 1988 and received closure from the SFDPH in December 2000. Tanks "3" and "4" were reportedly located in the area of Central Plaza Park, were 5,000 single walled steel tanks that held gasoline and diesel. The Port removed the tanks in 1990 in conjunction with the installation of a sewer force main within the 20th Street corridor. The	Access Road and auto storage.

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				regulatory status of this removal effort is unknown.	
Building 2 (Warehouse No. 2)	Building 2 stands east of the Courtyard and directly north of Building 12	Six-story, board-formed concrete warehouse, constructed in 1941 and 1944, rectangular in plan with a flat roof. The building measures 256' long, 76'-9" wide and 79'-6" high. It contains a total of 98,804 square feet and runs north-south, with a large freight elevator along the west wall. The floor is exposed concrete slab.	Constructed for WWII. Originally functioned as a warehouse to support hull construction at the Building 12 complex. The sixth floor contained a drafting room, and offices were located on the first and second floors. A bridge connected the fourth floor to the mold loft in Building 12, to the south.	Was used by non-profit for storage of clothing and furniture in 2001. Steel Storage was pictured to the west of the Building in the 1959 Sanborn map. A SCA Report Summary dated May, 2008 compiled available information on ACMs, lead based paint, PCBs and mercury switches indicated that Building 2 contained ACMs.	Building 2 is now used as a warehouse by Paul's Cost Less Storage. Port recently removed waste of unknown origin from building. Waste characterized as four drums non-hazardous waste solid (light fixtures, empty fuel cans, empty containers of elevator lubrication, etc.), one drum non-hazardous liquid (soapy material), seven drums corrosive waste liquid, three drums waste paint related material, one drum organic material solid waste, and three drums non-RCRA hazardous waste liquid (oil and water).
Building 12 complex (Plate Shop No. 2)	Located near the southwest portion of	Building 12 measures 248'-2" x 242'-2" in by 59'-6" tall, and	The Building 12 Complex, comprising Buildings 12,	In 1981, Old leaking transformers containing	Used for impounded vehicle storage by

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
	the Site at the terminus of 22nd Street.	contains a total of 118,890 square-feet spread across two floors. Construction is steel and wood with corrugated steel cladding. Asphalt paves the ground floor.	15, 16, 25, 32, and 66, was constructed mainly in 1941 as the central building of the New shipbuilding Yard. The building was designed and built by government (Navy) personnel as part of the joint WWII public-private shipbuilding effort. It housed the plate shop and mold loft and was central to hull construction at Slips 5-8. The plates were moved from the yard to Building 12 and from Building 15 to the welding platforms and slips via U. S. Navy-owned rail lines	PCBs were removed (referred to as operational area 2 in Envirostor Database). Walls, floors, and asphalt driveways were wipe sampled. Arochlor 1260 results before cleanup ranged, from 3 to 229 ug/wipe in Samples taken from the floor area (asphalt floor) ranged from non-detect to 62 parts ppm per million. After decontamination, confirmation samples ranged from less than 1 ug/wipe to 32. The asphalt confirmation samples were all within residential cleanup levels. (Aroclor 1260 was 220 ug/wipe area for residential, 1,000 ug/wipe area for industrial) Was used by City Tow for damaged auto storage in 2001. A hydraulic accumulator and 4’ x 16’ return tank were located on the northwest corner of the	Auto Return. Utility room housing a PCB-containing-transformer is present along the northern exterior wall of the building.

Table 1
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Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				building.	
Building 15 (Layout Yard)	Building 15 stands at the south end of and is part of the Building 12 Complex	Constructed in 1944. Measures 242' 8" x 71' 7", with an interior area of 17,134 square-feet. flat roof of wood	The Layout Yard was intermediate staging area for the steel plates of a vessel's hull used for hull construction in Slips 5-8. As the plates left Building 12 adjacent to the north, they were arranged, numbered, and checked against the molds and plans.	Was used by City Tow for Auto Storage in 2001. Large "burning tables" were present in 1944 in this building	The building is used by Auto Return for the storage of oily-waste drums.
Building 16 (Stress Relieving Building)	This Building is south of Building 15.	This two-story gabled warehouse measures 50'-10" by 152'-2" in plan and 45'7" in height. It contains a total of 7,588 square-feet. There is a large industrial furnace along the western side of the hydraulic actuators to tightly seal the furnace wrap around the door's perimeter. A chimney stands along the southern side, and numerous exposed mechanical systems envelop the north and south elevations of the furnace.	It was constructed in 1941 specifically for the WWII effort. The Stress Relieving Building was used for hull construction at the Building 12 Complex. Stress relieving involved re-heating the bond juncture, burning the ridge and inserting a splint or "strong back" mechanically and re-welding the joint in a controlled environment.	Building had two furnaces along the western portion of the building and two pre-heat rooms on the north.	The building is currently unused and vacant.
Building 25 (Washroom and Locker Room)	Building 25 stands stood in a courtyard created by three other buildings (15, 16, and 32,). The northern end attached to Building	This single-story, steel-frame, gable-roofed industrial building with corrugated metal-clad walls measures 51'-6" long by 29' wide by 19' tall, and contains1,407 square-feet. Built in 1941.	Bathroom, wash facilities and a locker room.	This building contains shower, bathroom, and locker facilities	The building is unused.

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
	15.				
Building 32 (Template Warehouse, 1941)	To the west of Building 25, its northern end attaches to Building 15.	Constructed in 1941, this single-story, semi-attached, rectangular warehouse with a gable roof is of steel frame construction with corrugated metal-clad walls. It measures 100' long by 50' wide by 32' high, and contains 4,900 square-feet. The interior ground floor has been repaved with asphalt.	The Template Warehouse, Building 32, stored wooden templates used in shaping steel hull plates at the Building 12 Complex.	-	Auto-Return company currently, leases the area.
Former Building 48 – (Boiler House and Pickling Plant)	This former building was east of Building 16.	Erected in 1941. It measures 28' long by 12' wide by 11-10' high, and contains 336 square-feet.	This was the Boiler House and Pickling Plant	In the southern portion of the building, a boiler was present along the western wall followed by six pickling tanks. Two are labeled as containing water. The others contained lye, hydrochloric acid, sulfuric acid, and lime. Adjacent to the tanks was a spray gun painting area and two welding platforms.	Not applicable – historic building. The area is currently a parking lot.
Lot west of Building 12 Complex	Paved parking area to the west of Building 12 Complex	-		The plate house office was west of Building 12 in 1944. Steel Storage was pictured to the west of the Building in the 1959 Sanborn map.	Used for vehicle parking by Auto Return

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				PG&E parcel known as the Hoedown Yard is adjacent. Elevated levels of arsenic have been documented in near surface soils to a maximum concentration of 530 mg/kg at 2.8 feet bgs. Concentrations decrease with depth and drop to background levels or non-detect by approximately 5 feet bgs. According to the RWQCB, the source of the arsenic is unknown. The area is currently paved and bermed, limiting surface water flow to the Site.	
Building 66/60/31 (Welding Shed)	To the northeast of Building 12	Constructed in 1945 on land that was formerly part of the Pacific Rolling Mills lands. Large, rectangular plan, two-story, steel frame shed with corrugated metal siding measures approximately 220' long by 105' wide and covers 23,100 square-feet. Along the west elevation, an attached men's locker room, measuring approximately 15' x 60', sits outside the main bay of Building 66.	Building 66 was used for welding pre-assemblies and other hull components during hull construction at the Building 12 Complex and Slips 5-8. Most of the yard was used for the production of war vessels. This open building sheltered outdoor activities so that the welding work would not have to depend on good weather.	Small aboveground tank was present along western elevation. Building formerly housed car crusher. Remediation of area occurred in 2000-2004. Used by City Tow as car-crushing, scrap metal storage with subsurface fluid drainage areas in 2001. Two above-ground	This structure is currently used for vehicle storage by Auto Return, the city's towing contractor.

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Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				storage tanks were present in 2001 Phase 1.	
Former Building 3 - Machine Shop #2	This former building was in the area between Buildings 2 and 66	Steel and wood building measured 310-6'-8" long by 132'-6" wide by 77" tall, and contains 42,271 square-feet.	Listed as government owned in 1944 and constructed in 1884, 1901, 1941. It was demolished between 1963 and 1977.	Building 3 held typical machine shop equipment. Cranes, an elevator, and transformers were present.	Not applicable – historic structure. The area is currently occupied by a parking lot.
Adjacent Areas					
Building 23 Boiler House Testing	Three small structures abut the eastern end of Building 113 – and are (from north to south) Buildings 118, 23, and 24.	Building 23 is a corrugated sheet metal-clad shed addition to Building 113.	Constructed in 1941	Listed as "government owned" in 1941. Prior owned listed as Columbia Steel Company. Steam boiler on southwest corner. Two storm drains to sewer.	No access during Site visit. Crane and steel plates were visible.
Building 24 (Bethlehem Steel Co. Washroom and Locker Room)	Building 24 stands at the east end of Building 113 and shares its western wall with Building 23	This one-story, exposed concrete building measures 38'-8" long by 15'-6" wide by11'-6" tall, and contains 519 square-feet.	This building originally functioned as a washroom and locker room for the Building 113. It was first installed in 1914 and upgraded in 1936 and 1941.	-	This building is currently unused. Reportedly there was a fire in this building.
Building/ Location 118	Oil Tanks		Listed as owned by Bethlehem Steel in 1937	Both a TetraTech report from December 1997 and Port records indicate that four underground storage tanks were removed from this area. USTs 104 and 105 were 11,280 gallon USTs that held heating oil. These tanks were removed in 1988 and received closure from the	Concrete foundation was present. Grass and weeds covered the area.

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Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				SFDPH in December 2000.	
Building 14 – Boiler shop and Heavy Warehouse	Building 14 stands east of the complex created by Buildings 113/114, 115/116 and	Built in 1941, Building 14 is a double-gable metal structure measuring 140' x 116'-6" in plan by 66" tall, containing 15,969 square-feet. Walls are corrugated metal, and the floor is asphalt. A 20-ton crane with cab runs along the south side.	Historically functioned as a Heavy Warehouse where equipment was stored for work on heavy machinery in Building 113 and for outfitting ships with mechanical and propulsion systems. A U. S. Navy-owned rail line transported materials from the warehouse to Slips 5-8.	Gun test base was present in the northeastern portion of the building. A transformer platform was located on the northeastern portion of the building. Was used by a moving and storage building for furniture storage in 2001. Hazardous waste storage for San Francisco Drydocks was located to the open area west of Building 14. 1914 Sanborn map shows 4,000 barrel fuel oil tank enclosed in 8'brick wall in Building 14 area or adjacent roadway to the east. Agency document indicate leaking transformer were stored in the building. San Francisco Drydock used the building for hazardous waste and material storage.	The building is currently used for storage by the Port's maintenance division.
Building 113 (Machine Shop No. 1)	South of 20th Street	The eastern portion was completed in 1885, and the	The eastern portion originally housed the	Building 113 was used by San Francisco	Some equipment was still present in the

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Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
		western in 1886. The two structures were joined by a connector in 1914. Two-block long industrial structure consists of the two original unreinforced brick buildings, and the central reinforced concrete connector. It measures 492' long by 175'-6" wide by 62' tall, and contains 89,686 square-feet of floor space.	blacksmith and boiler shop and the western portion originally housed the machine shop. End-grain wood blocks, roughly six inches square and covered with asphalt, pave the floor. By 1945, the entire Building 113 served as a Machine Shop Some shipyard offices were located in the basement of the Boiler Shop in the eastern portion of the building. The southwest corner of the Machine Shop had a brass foundry, copper shop, and tool room. An engine room was at the southeast corner of the machine shop.	Drydock as a machine shop in 2001.	building. Small oily areas were present on the floor in many areas of the building. A work pit was present on the eastern portion of the building.
Building 114 (Foundry and Foundry Furnace)	South of the western portion of Building 113. The interior of Building 114 is separated from that of 113 by a brick wall.	Building 114 measures 200' long by 40'-6" wide and contains approximately 8,000 square-feet of floor space. The floor is asphalt-paved. Rail lines run across the center of the building transversely, connecting to both Buildings 113 and 115. There are also 10 ton cranes, and several curbs and platforms that once held ovens, and furnaces.	Workers used large cranes and cupolas (round furnaces) capable of melting tons of iron, and used large core ovens, and pits for making castings of molten iron or steel. The main molding pit for making the largest metal castings was 14 feet in diameter and 14 feet deep. A second pit was 9 feet in	Building 114 was storing the foundry furnace in 2001. The 1886 Sanborn Map shows that the south end of the foundry had several functional features: a core room with core ovens at the southwest corner, three cupolas (round furnaces) on an iron floor in the center of the south end,	Used for storage by Port Maintenance.

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Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
			diameter and 10 feet deep.	and a coke shed at the southeast corner. From 1899-1905, however, the open space south of the foundry had a rail line, a Flask Storage Yard behind the Foundry's western portion, and a scrap iron yard behind its eastern portion.	
Building 115 (Foundry)	Located in between Buildings 114 and 117.	Constructed in 1916/1917, building 115 is one story tall and measures approximately 60' wide by 200' long.	Building 115 was constructed as a new foundry, adjacent to the original shipyard foundry, Building 114.	Building 115 is identified on the 1945 Bethlehem Steel General Plan as a foundry mold room building, in contrast to Building 114, which is identified as a foundry furnace building. Pouring pit in northeast corner. The 1959 Sanborn identifies this as a maintenance building. Was used by San Francisco Drydock as a foundry, molding room, and storage area for sandblast waste from operations during 2001 Phase 1	Used for Port Maintenance.
Building 116 (Warehouse and	South of Building115	Building 116 is a double-bay building measuring 120' by	1n 1945 Building 116 served a dual function: an	Was used by City Tow as a storage area in 2001	Used for Port Maintenance.

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Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
Ordnance Repair)		200'. With a total of 22,408 square feet.	ordnance repair shop in the northern half and a warehouse in the southern half.		
Building 117 (SF Shipyard Training Center – Warehouse No. 9)	Located between the remnants of Irish Hill to the south and Building 116	Constructed in 1937/41, Building 117 is a wide, one-story warehouse. It measures 240' long, by 131' wide, by 45'-6" high at the gable, and contains 30,940 square-feet .	Used as a warehouse.	The 1959 Sanborn identifies this as wire rope storage. Used by San Francisco Drydock as a sandblast pit. Port Plumbing supervisor stated that a septic tank had been installed lately prior to fixing the sewer lines. On former location of Coke Pile. Four USTs were reportedly located east of Buildings 116 and 117, as reported in the 1998 Phase I. The first two, a 5,000 gallon and 2,500 gallon tank, were removed in 1990. While analytical data was not found, SFDPH inspector notes indicated a hydrocarbon odor. The second two, a 2,160 gallon and a 576 gallon tank, were closed in	Currently used by Delancey Street foundation as a warehouse

Table 1
Historical Summary and Key Environmental Data
Pier 70 Phase 1 Environmental Site Assessment

Building/Area	Location	Description	Historical Use (per Port Historical Nomination unless otherwise specified)	Historical Details (per 1944 Bethlehem As-Builts unless otherwise specified)	Current use/ Reconnaissance observations.
				place. Except for acetone and methylene chloride, soil samples did not contain detectable levels of TPH, volatile organic compounds, semi-volatile organic compounds or metals.	

(1) Amec, 2011
(2) http://pier70sf.org
(3) E&E, 2001

PIER 70 RISK MANAGEMENT PLAN
Pier 70 Master Plan Area
San Francisco, California

Prepared For:
Port of San Francisco
San Francisco, California

25 July 2013
Project No. 730496301

Treadwell&Rollo
A LANGAN COMPANY

Table 1
Cleanup Levels for Soil Gas
Pier 70 Master Plan Area
Risk Management Plan
San Francisco, California

Chemical	Vapor Pressure Limit (µg/L)	Cleanup Level for a Resident (µg/L)	Cleanup Level for a Commercial Worker (µg/L)	Cleanup Level for a Recreational User (µg/L)
Volatile Organic Compounds (VOCs)				
Acetone	1.6E+09	2.5E+04	2.6E+05	1.7E+07
Benzene	4.1E+08	8.3E-02	1.0E+00	6.4E+01
2-Butanone	5.1E+08	5.2E+03	5.3E+04	4.3E+06
Carbon Disulfide	1.5E+09	7.5E+02	7.7E+03	5.4E+05
Chloroform	1.2E+09	4.1E-01	5.1E+00	2.9E+02
Dichlorodifluoromethane	3.9E+09	2.4E+02	2.5E+03	2.1E+05
1,1-Difluoroethane	2.7E+09	3.8E+04	3.9E+05	2.8E+07
Ethanol	2.0E+08	4.6E+03	4.7E+04	3.0E+06
Ethylbenzene	5.4E+07	1.1E+00	1.3E+01	8.7E+02
4-Ethyltoluene	1.5E+07	5.0E+02	5.1E+03	4.3E+05
Tetrachloroethene	1.5E+08	4.6E-01	5.7E+00	3.8E+02
Toluene	1.4E+08	3.1E+02	3.2E+03	2.4E+05
1,1,1-Trichloroethane	9.4E+08	1.1E+03	1.1E+04	8.9E+05
Trichloroethene	6.2E+08	1.3E+00	1.6E+01	1.0E+03
Trichlorofluoromethane	4.4E+09	7.2E+02	7.5E+03	5.6E+05
1,2,4-Trimethylbenzene	1.4E+07	9.1E+00	9.4E+01	8.0E+03
1,3,5-Trimethylbenzene	4.8E+05	9.1E+00	9.4E+01	8.1E+03
Vinyl Acetate	4.2E+08	2.1E+02	2.2E+03	1.6E+05
m,p-Xylene	5.8E+07	7.8E+02	8.0E+03	6.3E+05
o-Xylene	3.8E+07	7.2E+02	7.5E+03	5.6E+05
Semi-Volatile Organic Compounds (SVOCs)				
Naphthalene	6.1E+05	9.0E-02	1.1E+00	8.1E+01
Total Petroleum Hydrocarbons (TPH)				
TPH-Gasoline	----	4.9E+02	5.1E+03	Unlimited

Notes:

---- = Value not calculated: vapor pressures for individual fractions are presented in Table C-23 of Remedial Action Plan (T&R, 2012).

When RBTC is listed as Unlimited, the Hazard Index is less than 1 even when the vapor concentrations of all hydrocarbon fractions are at their maximum levels.

Values are the lower of the cancer or noncancer endpoint for each population evaluated.

Exposure pathways for soil gas Cleanup Levels include vapor migration to indoor air for residents and workers, and vapor migration to ambient air for the recreational scenario.

Table 2
Cleanup Levels for Groundwater
Pier 70 Master Plan Area
Risk Management Plan
San Francisco, California

Chemical	Water Solubility Limit (µg/L)	Cleanup Level for a Resident (µg/L)		Cleanup Level for a Commercial Worker (µg/L)		Cleanup Level for a Recreational User (µg/L)	
Volatile Organic Compounds (VOCs)							
Acetone	1.0E+09	4.4E+07		4.6E+08		1.7E+11	a
Benzene	1.8E+06	1.4E+00		1.7E+01		6.6E+03	
Bromobenzene	4.5E+05	2.2E+03		2.3E+04		1.1E+07	a
2-Butanone	2.2E+08	7.3E+06		7.5E+07		3.2E+10	a
sec-Butylbenzene	3.9E+03	5.4E+05	a	5.6E+06	a	2.5E+09	a
tert-Butylbenzene	3.0E+04	2.0E+03		2.1E+04		1.0E+07	a
Carbon Disulfide	1.2E+06	2.0E+03		2.1E+04		9.4E+06	a
Chloroform	7.9E+06	9.5E+00		1.2E+02		4.5E+04	
Chloromethane	5.3E+06	6.0E+02		6.2E+03		2.7E+06	
Cumene	6.1E+04	4.3E+03		4.4E+04		2.2E+07	a
p-Cymene	2.3E+04	3.2E+03		3.3E+04	a	1.6E+07	a
1,1-Dichloroethane	5.1E+06	2.7E+01		3.4E+02		1.3E+05	
1,1-Dichloroethene	2.2E+06	2.3E+02		2.3E+03		1.1E+06	
Ethylbenzene	1.7E+05	1.4E+01		1.8E+02		7.0E+04	
Methyl tert-butyl ether	5.1E+07	1.1E+03		1.4E+04		5.2E+06	
Methylene Chloride	1.3E+07	8.4E+01		1.0E+03		3.9E+05	
n-Propylbenzene	6.0E+04	4.4E+03		4.5E+04		2.2E+07	a
Toluene	5.3E+05	4.5E+03		4.7E+04		2.2E+07	a
1,2,4-Trimethylbenzene	5.7E+04	1.8E+02		1.8E+03		9.1E+05	a
m,p-Xylene	1.8E+05	1.1E+04		1.1E+05		5.3E+07	a
o-Xylene	1.8E+05	1.5E+04		1.5E+05		7.0E+07	a
Xylenes (total)	1.8E+05	1.1E+04		1.1E+05		5.3E+07	a
Semi-Volatile Organic Compounds (SVOCs)							
Acenaphthylene	1.6E+04	7.8E+03		8.1E+04	a	3.9E+07	a
Naphthalene	3.1E+04	2.3E+01		2.9E+02		1.2E+05	a
Phenanthrene	1.2E+03	2.2E+04	a	2.3E+05	a	1.1E+08	a
Total Petroleum Hydrocarbons (TPH)							
TPH-Diesel	----	Unlimited		Unlimited		Unlimited	
TPH-Gasoline	----	2.0E+02		3.0E+04		Unlimited	
TPH-Residual (Oil and Grease)	----	Unlimited		Unlimited		Unlimited	

Notes:
a - The Cleanup Level is greater than the water solubility limit, therefore it should not be possible to have cancer risks greater than 1x10-6, or non-cancer hazards greater 1.
---- = Value not calculated: vapor pressures for individual fractions are presented in Tables C-25 to C-27 of the Remedial Action Plan (T&R, 2012).
When RBTC is listed as Unlimited, the Hazard Index is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Values are the lower of the cancer or noncancer endpoint for each population evaluated.
Exposure pathways for groundwater Cleanup Levels include vapor migration to indoor air for residents and workers, and vapor migration to ambient air for the recreational scenario.

Table 4
Soil Import Criteria
Pier 70 Master Plan Area
Risk Management Plan
San Francisco, California

Chemical	Environmental Screening Levels[1]	Background Concentrations Soil	Background Concentrations Serpentinite Rock
Volatile Organic Compounds (VOCs)	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**
Acetone	60,000		
Benzene	0.74		
2-Butanone	--		
Butylbenzene	--		
Carbon Disulfide	82		
Carbon Tetrachloride	0.12		
Chloroform	1.1		
p-Cymene	--		
1,2-Dichloroethane	0.44		
trans-1,3-Dichloropropene	0.27		
Ethylbenzene	4.8		
2-Hexanone	21		
Methyl Acetate	7,800		
4-Methyl-2-pentanone	530		
Methylene Chloride	9.9		
n-Propylbenzene	340		
Tetrachloroethene	0.55		
Toluene	1,000		
1,1,1-Trichloroethane	11,000		
Trichloroethene	1.7		
Trichlorofluoromethane	79		
Vinyl Acetate	97		
m,p-Xylene	600		
o-Xylene	600		
Xylenes (total)	600		
Semi-Volatile Organic Compounds (SVOCs)			
Acenaphthene	3,400		
Acenaphthylene	--		
Anthracene	23,000		
Benzo(a)anthracene	0.38		
Benzo(a)pyrene	0.038		
Benzo(b)fluoranthene	0.38		
Benzo(g,h,i)perylene	--		
Benzo(k)fluoranthene	0.38		
bis(2-Ethylhexyl)phthalate	160		
Butylbenzylphthalate	260		
Chrysene	3.8		
Dibenz(a,h)anthracene	0.11		
Fluoranthene	2,300		
Fluorene	3,100		
Indeno(1,2,3-cd)pyrene	0.38		
2-Methylnaphthalene	230		
Naphthalene	3.1		
Phenanthrene	--		
Pyrene	3,400		
Pesticides/Polychlorinated Biphenyls			
Polychlorinated biphenyls	0.22		
gamma-Chlordane (chlordane ESL)	0.44		
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000045		
Endosulfan I (Endosulfan ESL)	470		
Heptachlor epoxide	0.061		
beta-Hexachlorocyclohexane	0.27		
Metals			
Aluminum	7,700	9.05 [2]	12- 14[6]
Antimony	30		
Arsenic *	9.5	11.5 [3]	0.8- 10[6]
Barium	5,200	314.4 [2]	0.9- 11.4[6]
Beryllium	150	0.71 [2]	0.5 [6]
Cadmium	1.7	2.2 [2]-3.14[5]	0.5 [6]
Chromium (total)	--	81 [4]	1,300 [4]
Chromium VI	17	NA	NA
Cobalt	660	11 [4]	140 [4]
Copper	3,000	124 [2]-175 [5]	5- 16.6 [6]
Cyanide (total)	37		
Lead	150	8.99 [2]	0.2- 36.1[6]
Manganese	180		
Mercury	18	2.28 [2]	0.1[6]- 0.2[6]
Molybdenum	380	2.68 [2]	5 [6]
Nickel	1,600	50 - 2,930[5]	499- 1910[6]
Selenium	380	0.5 [4]	5 [6]
Silver	380	1.43 [2]	5 [6]
Thallium	5	1 [4]	1.6 - 3 [6]
Vanadium	530	83[2]-117[5]	5.0- 15.6[6]
Zinc	23,000	110[2]-423[5]	20.8- 51.7[6]
Total Petroleum Hydrocarbons (TPH)			
TPH-Diesel	240		
TPH-Gasoline	490		
TPH-Residual (Oil and Grease)	10,000		

Notes:
mg/kg - milligrams per kilogram
Values are the lower of the cancer or noncancer endpoint for each population evaluated.
Exposure pathways for soil Cleanup Levels include dermal contact with soil, ingestion of soil, and inhalation of wind-blown particulates.
***** As presented in the Remedial Action Plan (T&R, 2012), the background arsenic level is 9.5 mg/kg.
-- - Not Established

USEPA Regional Screening Levels for Residential Land Use, May 2013. Available Online at:
http://www.epa.gov/region9/superfund/prg/
California EPA Human Health Screening Levels for Residential Land Use, January 2005

[1] - Water Board Environmental Screening Level from Regional Water Quality Control Board Screening for Environmental Concerns at Contaminated Sites (Table K-1 - Soil Direct Contact Residential Land Use) May 2013.

[2] - Background concentrations from *Draft Final Remedial Investigation/Feasibility Study Report for Parcel E-2, Hunters Point Shipyard, San Francisco, California*. Engineering Remediation Resource Group (ERRG), February 2009.

[3] - Arsenic background concentration from *Addendum - Work Plan for Additional Soil Investigation, Hoe Down Yard Pacific Gas and Electric Company, Potrero Power Plant Site, San Francisco, California*. AMEC Geomatrix, 9 July 2009.

[4] - Background concentrations from *Development of Presidio-Wide Cleanup Levels for Soil, Sediment, Groundwater, and Surface Water. Presidio of San Francisco, California*, Presidio Trust, October 2002. Soil background concentrations from Beach Dune Sand.

[5] - Background concentrations from *Memorandum regarding Comparison of Ambient Levels of Arsenic, Cadmium, Copper, Manganese, Nickel, Vanadium, and Zinc Present at Parcel A with Four Non-HPS Sites.* T&R, 12 October 2004.

[6] - Background concentrations from *Metals Concentrations in Franciscan Bedrock Outcrops, Hunters Point Shipyard, San Francisco, California.* Tetra Tech, Inc. 17 March 2004.
* Represents background concentration presented in the RAP (Treadwell & Rollo 2012)
-- Not Established
EPA - United States Environmental Protection Agency

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Pier 70 Mixed-Use District Project

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