

CHAPTER 4 **Affected Environment**

4.1 **INTRODUCTION**

This chapter of the Draft EIR/EIS describes the existing conditions at the Project site as they relate to each environmental topic evaluated in this document. This chapter also identifies applicable federal, state, and local plans, policies, and regulations that pertain to the environmental topics considered in the analysis.

4.1.1 **Scope of the Analysis**

This chapter and Chapter 5, *Environmental Consequences*, address the full range of environmental topics required by CEQA and those topical areas required under NEPA (per CEQ Regulations [40 CFR §1502.15]). This chapter describes the existing physical environmental conditions in the Project area with respect to each environmental topic at an appropriate level of detail that will allow the reader to understand the impact analysis presented in Chapter 5.

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4.2 LAND USE AND LAND USE PLANNING

4.2.1 Introduction

This section describes the general land use setting of the Project site and vicinity. Several land use issues were raised during the Notice of Preparation and Notice of Intent scoping periods. Specifically, comments were made regarding the proposed density of the Project site, the mix of uses, Project conflicts with land use and zoning laws, design of the new development, and impacts to neighborhood character. These areas of concern will be addressed in Section 5.2, *Land Use and Land Use Planning*.

4.2.2 Environmental Setting

■ Existing Land Uses

The Project site is located on the southeastern border of the Potrero Hill neighborhood. As shown in Figure 1-1 in Chapter 1, *Project Purpose, Need, and Objectives*, the Project site is one and one-half blocks (or approximately 1,500 linear feet) west of Interstate 280 (I-280), four blocks (or approximately 1,850 linear feet) east of U.S. Highway 101 (US 101), and two blocks (approximately 950 linear feet) north of Cesar Chavez Street, and is bordered to the northwest by the Potrero Hill Recreation Center. The eastern edge of the site sits on a ridge paralleling Pennsylvania Avenue below. The Project site comprises several parcels, as follows:

- Potrero Terrace: Assessor's Parcel Numbers (APNs) 4167/004A and 004,
- Potrero Annex: APNs 4220A/001, 4223/001, and 4285B/001, and
- San Francisco Unified School District: APN 4287/001A.

Combined, these parcels have a total acreage of approximately 39 acres, including internal roadways. Some areas of the Project site have very steep slopes. The highest topographic elevation within the Project site is to the north at the intersection of 23rd Street and Arkansas Street at 265 feet above mean sea level (msl) and the lowest elevation is to the south at the intersection of 26th Street and Connecticut Street at 40 feet above msl. The Project site is generally sloped from north to south and from west to east.

The physical character of the Project site is typical of public housing developments constructed during the 1940s and 1950s and is distinctively different from the surrounding area.¹ There are 38 residential buildings in the Terrace and 23 residential buildings in the Annex for a total of 620 units. The existing buildings are two to three stories tall with typical heights of approximately 24 to 34 feet, depending on where they are measured from. The buildings are rectangular and low-slung, with

¹ San Francisco Planning Department. 2011. Historic Resource Evaluation Response, 1095 Connecticut Street (Potrero Terrace/Annex). July. San Francisco, CA.

relatively little architectural detail. The 38 Terrace buildings have some architectural variation, but, on the whole, have a very uniform appearance. The 23 Annex buildings are distinguishable from the Terrace buildings, but bear a strong resemblance to them. The architectural style of the buildings on the Project site is not similar to other surrounding residential developments.

The buildings across the Terrace site are nearly identical, as are the buildings on the Annex site. Terrace buildings are distinguishable from Annex buildings because they feature a hipped mission barrel tile roof. The footprint of each building is aligned with the natural topography of the steeply sloping site. This gives the overall appearance that the buildings are situated randomly on the site, although they actually follow the natural contours of the land. This design was employed to minimize the amount of cut and fill needed, and to minimize erosion. The areas surrounding the buildings feature concrete walkways, steps, retaining walls, and limited vegetation. Behind each building are T-shaped clothesline poles. Currently, there is generally limited programmed outdoor space on the Project site.

In addition to the residential buildings, there is an administrative office in the Terrace at the northeast corner of 25th Street and Connecticut Street, and a Family Support Center and child care center in the Annex. The San Francisco Unified School District site is currently vacant. In general, the development pattern of the Project site appears to be inconsistent with the pattern of the surrounding neighborhood and the bisecting streets do not follow the typical grid pattern of City streets. As shown in Figure 1-1 in Chapter 1, *Project Purpose, Need, and Objectives*, the existing streets within the Project site travel in a curvilinear (northwest/southeast) direction or end in a cul-de-sac, which lends to the distinctive character of the site.

■ **Surrounding Land Uses**

Surrounding land uses include residential, commercial, recreational, institutional, production, distribution, and repair (PDR), and industrial uses. Most residential buildings in the Project vicinity are two to four stories tall with typical heights of approximately 25 to 35 feet. Land uses to the north include multi-family residences, single-family residences, and the Potrero Hill Recreation Center (generally zoned RH-2, RH-1, and P). Further to the north is the Potrero Hill neighborhood core. North of the Potrero Hill neighborhood is Showplace Square and further north is the South of Market neighborhood. Land uses to the west include multi-family residences, single-family residences, and Starr King Elementary School (generally zoned RH-2, RH-1, and P). Farther west, US 101 and Potrero Avenue separate Potrero Hill from the Mission neighborhood. Figure 4.2-1 illustrates the existing land uses in the areas surrounding the Project site.



SOURCE: Atkins, 2011.

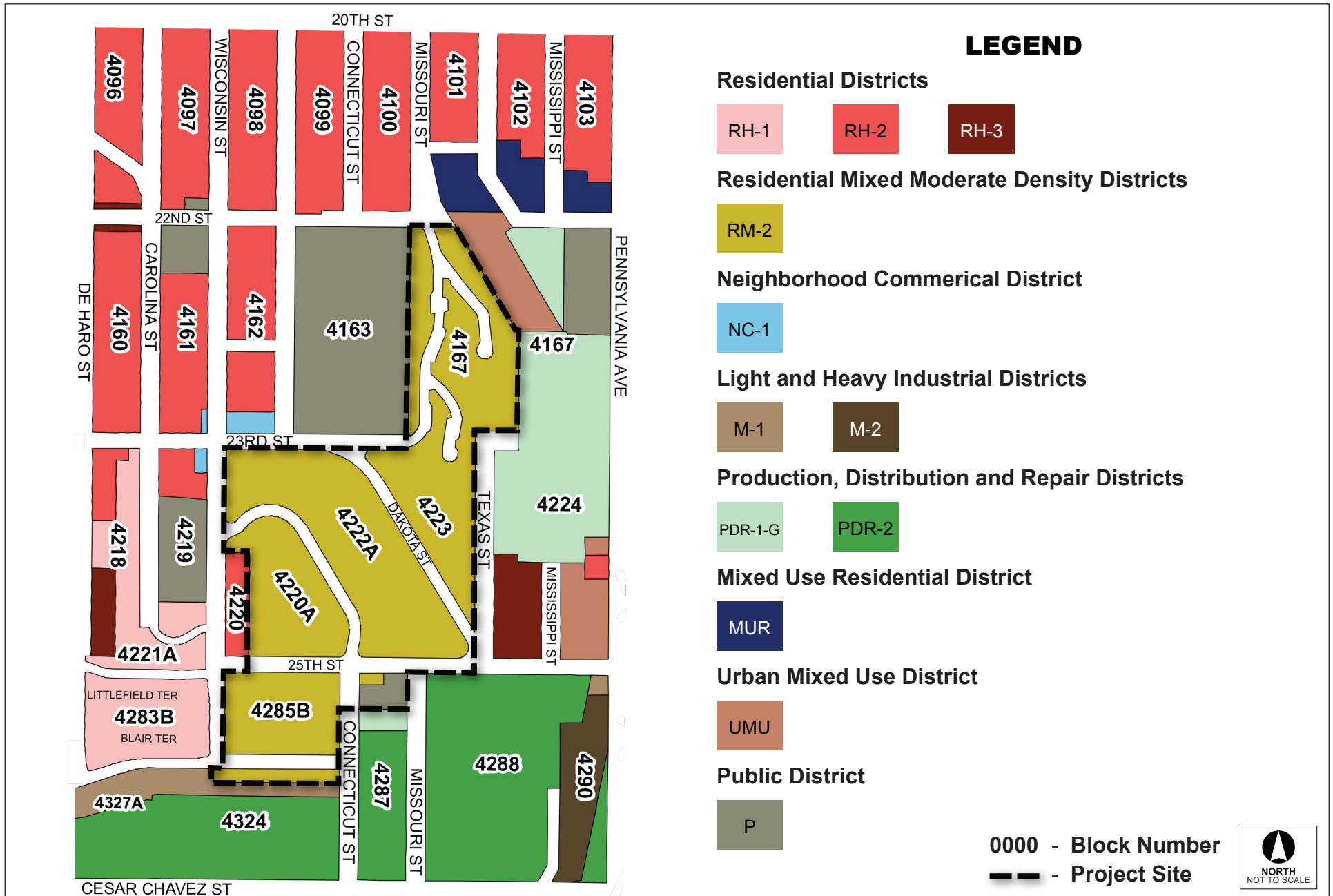
POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.2-1: EXISTING LAND USES

Land uses to the south and east include industrial and PDR uses (generally zoned PDR-1-G and PDR-2). PDR uses refer to a wide variety of activities which typically occur in industrially zoned areas. PDR-1-G Districts are intended to retain and encourage production, distribution, and repair activities and promote new business formation. This district prohibits residential and office uses, and limits retail and industrial uses.² PDR-2 Districts are intended to encourage the introduction, intensification, and protection of a wide range of light and contemporary industrial activities. These districts prohibit new housing, large office developments, large-scale retail, most institutional uses, and the heaviest industrial uses. All other uses are generally permitted.³ Existing zoning districts in the Project area are shown in Figure 4.2-2.

Cesar Chavez Street to the south marks the border between Potrero Hill and the Bayview-Hunters Point neighborhood. Across Texas Street to the east are multi-family residential, single-family residential, and industrial uses. East of Texas Street, Pennsylvania Avenue separates Potrero Hill from the Dogpatch and Central Waterfront neighborhoods. I-280 and the Caltrain corridor run parallel to Pennsylvania Avenue and provide a physical barrier between Potrero Hill and the areas to the immediate east. A Caltrain station is located on 22nd Street underneath I-280, just down the hill and west of the northern border of the Project site.

² City and County of San Francisco. 2013. *San Francisco Planning Code*. December. Available: < [http://www.amlegal.com/nxt/gateway.dll/California/planning/planningcode?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca\\$synce=1](http://www.amlegal.com/nxt/gateway.dll/California/planning/planningcode?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$synce=1)>. Accessed: February 25, 2014.

³ City and County of San Francisco. 2013. *San Francisco Planning Code*. December. Available: < [http://www.amlegal.com/nxt/gateway.dll/California/planning/planningcode?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca\\$synce=1](http://www.amlegal.com/nxt/gateway.dll/California/planning/planningcode?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$synce=1)>. Accessed February 25, 2014.



SOURCE: City and County of San Francisco, 2011.

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FIGURE 4.2-2: EXISTING ZONING DISTRICTS

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4.3 VISUAL QUALITY/AESTHETICS

4.3.1 Introduction

This section describes the visual character and aesthetics of the affected environment within and around the Project site. The visual character and aesthetics of an area is created by elements of the natural and built environment and their physical relationship to each other, as perceived by people. This section focuses on the existing visual character of the Potrero Hill area and the Project site, including the views of and from the Project site.

Several comments on aesthetics were submitted during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods. Specifically, concerns were raised regarding: increased building heights, inconsistency with the design of existing buildings, impacts to existing views and vistas, tree removal, reductions in open space, and lighting and glare impacts. However, comments made on the NOP are not addressed in this document as they relate to CEQA. On September 27, 2013, Governor Brown signed Senate Bill (SB) 743, which became effective on January 1, 2014. Among other provisions, SB 743 added Section 21099 to the Public Resources Code and eliminated the analysis of aesthetics for certain urban infill projects under CEQA. The Proposed Project meets the definition of a mixed-use residential project on an infill site within a transit priority area as specified by Section 21099. Accordingly, this document does not provide CEQA conclusions regarding aesthetics, which can no longer be considered in determining the significance of the Proposed Project's physical environmental effects under CEQA. Implementation of SB 743 was subsequent to the publication of the NOP, which had indicated that the EIR would include a discussion of aesthetics-related impacts of the Proposed Project. However, since the Proposed Project is subject to NEPA, comments made on the NOI as they relate to aesthetics are addressed and NEPA conclusions are provided in Section 5.3.

4.3.2 Environmental Setting

■ Regional Visual Setting

The Project site is situated on the southern and eastern slope of Potrero Hill, which is located in the southeast portion of the City. As shown in Figure 1-1 (Chapter 1, *Project Purpose, Need, and Objectives*), the neighborhood is generally bound by 16th Street to the north, Interstate 280 (I-280) to the east, 25th Street/26th Street to the south, and U.S. Highway 101 (US 101)/Potrero Avenue to the west. North of the Potrero Hill neighborhood is Showplace Square, and further north is the South of Market neighborhood. The Project site is approximately 1 mile west of the San Francisco Bay. The visual character of the vicinity is that of a built-out urban area. Generally, the City has a rectilinear street grid, and buildings are constructed to the lot line.

■ **Local Visual Setting**

The residential portion of Potrero Hill can be separated between the northern and southern portions. The northern slope has unobstructed views of the high-rise buildings in the Financial District to the north and the Bay to the east. This area of Potrero Hill has a fairly uniform development pattern consisting of Victorian-era and early 20th century single-family and multi-family dwellings, two- to three-stories in height, with limited setbacks. The residential streets on the northern slope are relatively wide, allowing for ample street parking. The northern slope also includes neighborhood commercial corridors, which are pedestrian-oriented and contribute to a fine pattern and an intimate scale.¹

The southern slope has a greater mix of uses, resulting in a less coherent development pattern. Towards the base of the hill to the south, and along the I-280 corridor to the east, the local streets are lined with industrial uses and large warehouse buildings with associated parking lots. As the hill slopes upward, the Potrero Terrace (Terrace) and Potrero Annex (Annex) housing developments (the Project site, as described in more detail below) encompass a large portion of the hillside. More uniform single-family and multi-family residential units and Starr King Elementary School are located to the west of Wisconsin Street. Most residential buildings in the Project vicinity are two to four stories tall with typical heights of approximately 25 to 35 feet. At the apex of the hill sits the 9.6-acre Potrero Hill Recreation Center; however, due to its location at a higher elevation, the Recreation Center is not a dominant characteristic visible from the lower portion of neighborhood. Regional vehicular access to/from Potrero Hill is provided by I-280 and US 101, located to the east and west of Potrero Hill, respectively.

■ **Project Site Visual Setting**

The Project site comprises several parcels that contain the Terrace, the Annex, and an adjacent San Francisco Unified School District (SFUSD)-owned property. Combined, these parcels total approximately 39 acres. The Project site includes 38 residential buildings on the Terrace parcel and 23 residential buildings on the Annex parcel. The SFUSD site, also referred to as Block X, is vacant. The existing buildings are two to three stories tall with typical heights of approximately 24 to 34 feet. The circulation between the buildings consists of concrete walkways, steps, and retaining walls.

Currently, there are 254 trees that would be considered “significant” on and within the vicinity of the Project site.² The significance determination is based on the following: the trees are within 10 feet of a lot line abutting a public right-of-way and are above 20 feet in height, have a canopy greater than 15 feet in diameter, or have a trunk diameter greater than 12 inches at breast height. Out of the

¹ City and County of San Francisco, Planning Department, *Eastern Neighborhoods Rezoning and Area Plans Final EIR* (August 2008), <http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=3999> (accessed July 11, 2011).

² GLS Landscape/Architecture, Tree Disclosure Statement (June 23, 2010).

254 significant trees, 249 are located on the Project site, while five trees are on adjacent properties that overhang the Project site. There are no landmark trees or street trees.³

Potrero Terrace

The Terrace site is generally bound by 23rd Street to the north, Texas Street to the east, 26th Street to the south, and Wisconsin Street to the west. The 17.6-acre Terrace site currently includes 38 separate buildings, open spaces, mature trees, limited vegetation, and parking for residents.

On-Site Topography. The Project site is characterized by steep topography and uneven slopes. The highest topographic elevation is to the north at the intersection of 23rd Street and Arkansas Street at 265 feet above mean sea level (msl) and the lowest elevation is to the south at the intersection of 26th Street and Connecticut Street at 40 feet above msl. The footprint of each building is aligned with the site topography, oriented according to the slope.

Visual Character and Development Pattern. The most prominent feature at the Terrace site is the topography. Due to the steep terrain, the Terrace buildings and the streets were constructed to match the contours of the hillside. This gives the appearance that the buildings are situated randomly on the hillside; however, they actually follow the contours of the land to reduce the required amount of soil cut and fill and to help prevent erosion. As such, the development pattern of the Project site is visually inconsistent with its surroundings and the bisecting streets do not follow the typical grid pattern of City streets.

Each of the buildings is rectangular in plan, constructed of reinforced poured-in-place concrete, and features a hipped, mission barrel tile roof. Because of the steep slopes at the Terrace site, the buildings are two stories in height on the uphill side and three stories on the downhill side. The alternating blue-, white-, and terracotta-colored buildings have minimal architectural articulation and detail. The façades facing south feature a second-floor balcony with metal wire-mesh railing. The entry doors are located on both the northern and southern façades at ground level and the windows are relatively small and uniform. The side elevations of the buildings feature a single entry door with wire-mesh railing and a flat concrete awning projection above.

The areas surrounding the buildings feature concrete walkways, steps, retaining walls, and limited vegetation. T-shaped pipes, which are visible from the surrounding streets, are evenly spaced along the internal walkways for hanging laundry. Overhead wires with utility poles are prominent features along the Project site perimeter and traverse the site in some areas. In addition, parking stalls are provided in designated areas at 90-degree angles in driveways.

The moderate-scale development and open space between the buildings at the Project site are inconsistent with surrounding industrial uses to the east and south and gridded streets with dense housing to the north and west. This contrast contributes to an incoherent visual pattern with limited

³ GLS Landscape/Architecture, Tree Disclosure Statement (June 23, 2010).

unity between the Terrace site and its surroundings. However, the Terrace site is visually consistent with the development at the Annex site, which is discussed in more detail below.

Vegetation and Lighting. Vegetation throughout the Terrace site is in poor condition and sparse. Between the buildings and concrete walkways is a combination of grass, dirt, small shrubs, and mature trees. The mature trees are scattered intermittently throughout the site without a consistent pattern. There are no street trees. Sloped lawns are located between the buildings to the west of Connecticut Street. In addition, flower beds are located immediately in front of the south-facing façades of the buildings. The buildings between Dakota Street and Connecticut Street are on a steeper slope, making landscaping difficult to grow and maintain. Therefore, vegetation is sparse in this area.

Street lighting is currently limited at the Terrace site. Cobra-style street lighting⁴ is evenly spaced along Dakota Street, Connecticut Street, Wisconsin Street, 23rd Street, 25th Street, and 26th Street. No lighting is provided on the walkways or open spaces between or around the units. One wall-mounted light fixture is provided at each door, along the roofline. At night, some interior light from the buildings spills onto the adjacent open spaces and streets.

- **Visual Quality and Affected Viewers.** Overall, the visual quality of the Potrero Terrace is moderately low. This is due to buildings which lack architectural appeal, have occasional windows and doors that are boarded, and the lack of landscaping. Overall visual feel is stark. Roadways, pathways, and parking areas are in various states of repair and while some are maintained, others are deteriorating. Non-landscaped areas are denuded of vegetation. Residential viewers living at the Project site are deemed to have moderately high viewer sensitivity to changes occurring at the Project site as residents are likely to have a high sense of ownership over views.

Potrero Annex

The Annex site is generally bound by Missouri Street to the north and west, Texas Street to the east, and Dakota Street to the south and west. Separating the site from I-280 are industrial uses/warehouses to the east. Potrero Hill Recreation Center borders the site to the west. The 7.24-

⁴ Cobra-style lamps are the most common form of street lighting, with the luminaire mounted on a utility pole that curves to hang over the street.

acre site currently includes 23 separate buildings, open spaces, mature trees, limited vegetation, and parking for residents.

On-Site Topography. The Project site is characterized by steep topography and uneven slopes, which have been significantly modified from their natural, undeveloped state. The highest topographic elevation is to the northwest along Missouri Street at 220 feet above msl and the lowest elevation is to the east along Texas Street at 60 feet above msl. The footprint of each building is aligned with the topography, oriented according to the slope.

Visual Character and Development Pattern. The most prominent feature at the Annex site is the topography. Due to the steep terrain, the Annex buildings and the streets were constructed to match the contours of the hillside. Two cul-de-sacs, Watchman Way and Turner Terrace, extend east into the development from Missouri Street. Texas Street, to the east of the site, is an extremely narrow, unevenly paved, unmarked roadway.

The wood-framed, rectangular buildings painted in blue, white, and terra-cotta colors have flat roofs canted at a slight angle. The two- and three-story buildings feature a combination of the original windows and replacement windows, evenly spaced along the façades of the buildings. The east-facing elevations feature second- and third-floor balconies with clapboard rails. The west elevations feature entries with flat awnings, some of which provide an area for flower pots. Buildings include staircases leading from the second-level balcony to the third-level balcony on either the north- or south-facing façade.

The areas surrounding the buildings include a circulation network of concrete walkways and stairs, with chain-link fencing and some mature trees. Play areas are enclosed by chain-link fencing on the east-facing, level areas adjacent to some buildings. Overhead wires with utility poles traverse the site in certain areas. In addition, limited parking areas are provided at 90-degree angles in areas removed from the street. Most parking areas are paved and unmarked. Along Texas Street, off-street parking is provided in unmarked, dirt offshoots. Parallel parking is also available.

The moderate-scale development and expanse of open space between the buildings is inconsistent with industrial uses to the east and the Potrero Hill Recreation Center to the west. The various uses provide incoherent visual patterns and limited unity of the Annex site with respect to its surroundings. However, the Annex site is similar to the development at the Terrace site, which is discussed above.

Vegetation and Lighting. Landscaping throughout the Annex site is minimal. The landscaping is urban and limited to mature trees and dirt hills with non-native, ruderal groundcover and shrubs. The mature trees are scattered intermittently throughout the site and there are no street trees. Lighting is currently limited. Cobra-style lighting is evenly spaced along Missouri Street, Turner Terrace, and Watchman Way. Texas Street features only two light fixtures, which are attached to the utility poles that run east/west along the hill. Wall-mounted light fixtures are provided on the

exteriors of each building. No lighting is provided on the walkways or open spaces between or around the units. At night, some interior light from the buildings spills onto the adjacent open spaces and streets.

Visual Quality and Affected Viewers. Overall, the visual quality of Potrero Annex is moderately low since, while the buildings are maintained to a degree, they lack architectural appeal, have windows and doors that are boarded, and the overall visual feel is stark due to a lack landscaping which, if present, would improve visual conditions and soften the transition between buildings and outdoor spaces. Roadways, pathways, and parking areas are in ill-repair and are deteriorating. Residential viewers living at the Project site are deemed to have moderately high viewer sensitivity to changes occurring at the Project site as residents are likely to have a high sense of ownership over views.

SFUSD Site

The SFUSD site is bound by 25th Street to the north; a vacant site to the east; a plumbing, heating, and cooling supplies warehouse to the south, and Connecticut Street to the west. The SFUSD site consists of a paved basketball court and a paved area with cracked asphalt and weeds; both of which are open to the public. A chain-link fence lines the perimeter of the basketball court. To the south of the basketball court is a paved area with ruderal vegetation, also surrounded by a chain-link fence. To the south of this area, between the warehouse building and the SFUSD site, are several mature trees. No lighting is provided at the site. Overall, the visual quality of SFUSD site is low because it lacks organized site programming of outdoor space, is not well-maintained and is in a state of neglect, and is generally visually deteriorated. Viewers using the site have moderately low viewer sensitivity because while this site provides recreational opportunities, it is degraded and other, higher-quality, recreational facilities are located nearby, such as at the Potrero Hill Recreation Center.

Site Visibility and Existing Views

A “viewshed” is what people can see in the landscape, and can be either confined or expansive. A viewshed is defined by the physical constraints of the environment and the physiological limits of human sight. Physical constraints of the environment include landform, land cover, and atmospheric conditions. Landform can limit views or provide an elevated perspective for viewers. Similarly, land cover such as trees and buildings can limit views while low growing vegetation and the absence of structures can allow for unobscured views. Atmospheric conditions such as smoke, dust, fog, or precipitation can temporarily reduce visibility.

The physiological limits of human sight are affected by location, proximity, and light. Location refers to the topographic position of the viewer such as being even with or above or below what is being observed. Proximity is broken down into three distance zones: foreground (up to 0.5 mile from the viewer), middleground (0.5 mile to 3 to 5 miles from the viewer), and background (from 3

to 5 miles to infinity). Features in the landscape are more dominant and have a greater importance the closer the resource is to the viewer; whereas importance is reduced the further away features are from the viewer. This is because details and features in the landscape, including project elements, become lost and comprise a smaller portion of the total landscape as distance from the viewer increases. In the background, the scale and color of existing landscape elements and project features blend so that only broad forms, large-scale patterns, and muted colors are evident. Light influence also plays a large role in affecting views such as during the daytime when views are more readily available versus the nighttime when darkness greatly reduces the ability to see details and color in the landscape without bright moonlight or artificial light sources. In addition, lighting levels change throughout the day, making color and individual forms more prominent with more light and less distinct as light decreases.

The environment's physical constraints and limits of human sight combine to provide for viewsheds that range from restrictive and more confined to expansive and wider reaching, like scenic viewsheds.⁵

Scenic viewsheds generally encompass a wide area with long-range views to surrounding elements in the landscape. Such views are afforded usually because a flat landscape with little vegetation or an elevated viewing point allows for views out and over the surrounding landscape. Viewsheds also have a directional range, which is to say that some viewpoints have scenic viewsheds with a 360-degree view in all directions, while others may be limited in one direction in a manner that reduces the line of sight angle and amount of vista that is visible for a narrower viewshed. In such cases, narrower viewsheds are often confined by topography, development, and vegetation. Scenic viewsheds allow the public panoramic view access to natural features, including views of the ocean, striking or unusual natural terrain, or unique urban or historic features, also referred to as scenic resources. The term "view corridor" refers to views of significant features from along a path, roadway, or other horizontal corridor where the view is more confined by obstructions such as development or vegetation. As such, a view from a view corridor has limited lateral visibility and is referred to as a channelized view. Within a viewshed, a scenic resource is broadly defined as something in the environment with scenic or visual qualities and can include (but is not limited to) stands of trees, rock outcroppings, historic buildings, views of an urban skyline, or a visually important area of land, water, and/or other environmental and physical elements that can be seen. Scenic resources may be protected by federal, state, or local regulations or can be resources that are highly valued by the local community. Sensitive viewing points within the City include parks, historic properties,

⁵ Federal Highway Administration. 2015. *Guidelines for the Visual Impact Assessment of Highway Projects*. (FHWA-HEP-15-029.) USDOT (US Department of Transportation). Washington, DC. January 2015. (pp. 4-5 – 4-9, 6-3 – 6-4) and Litton, R. Burton, Jr. 1968. *Forest Landscape Description and Inventories – A Basis for Land Planning and Design*. (U.S. Department of Agriculture Forest Service Research Paper PSW-49) Pacific Southwest Forest and Range Experiment Station. Berkeley, CA. 1968. (pp. 3 – 5)

publicly-accessible buildings, and public rights-of-way that offer a view of the urban and natural landscapes making up the Bay Area viewshed.

Due to the steep topography of the Project site and low-scale development in the immediate vicinity, views to and from the Project site are extensive. Foreground views from the Project site include the existing housing developments at Terrace and Annex sites and the limited mature trees and vegetation. Foreground views of the adjacent Potrero Hill Recreation Center from the north (Terrace) and west (Annex) is limited due to the park's higher elevation; only the retaining wall and perimeter vegetation is visible.

Immediate middleground views from the Project site include the surrounding development, with the warehouses and industrial uses to east and south, and the residential development and Starr King Elementary School to the west. In addition, the Annex site includes mid-range views of the residential area in the northern portion of Potrero Hill. This view includes dense, mainly single-family residential units with landscaped front and backyards. Middleground views extend further away from the Project site and encompass the dense development in the southeastern portion of the City.

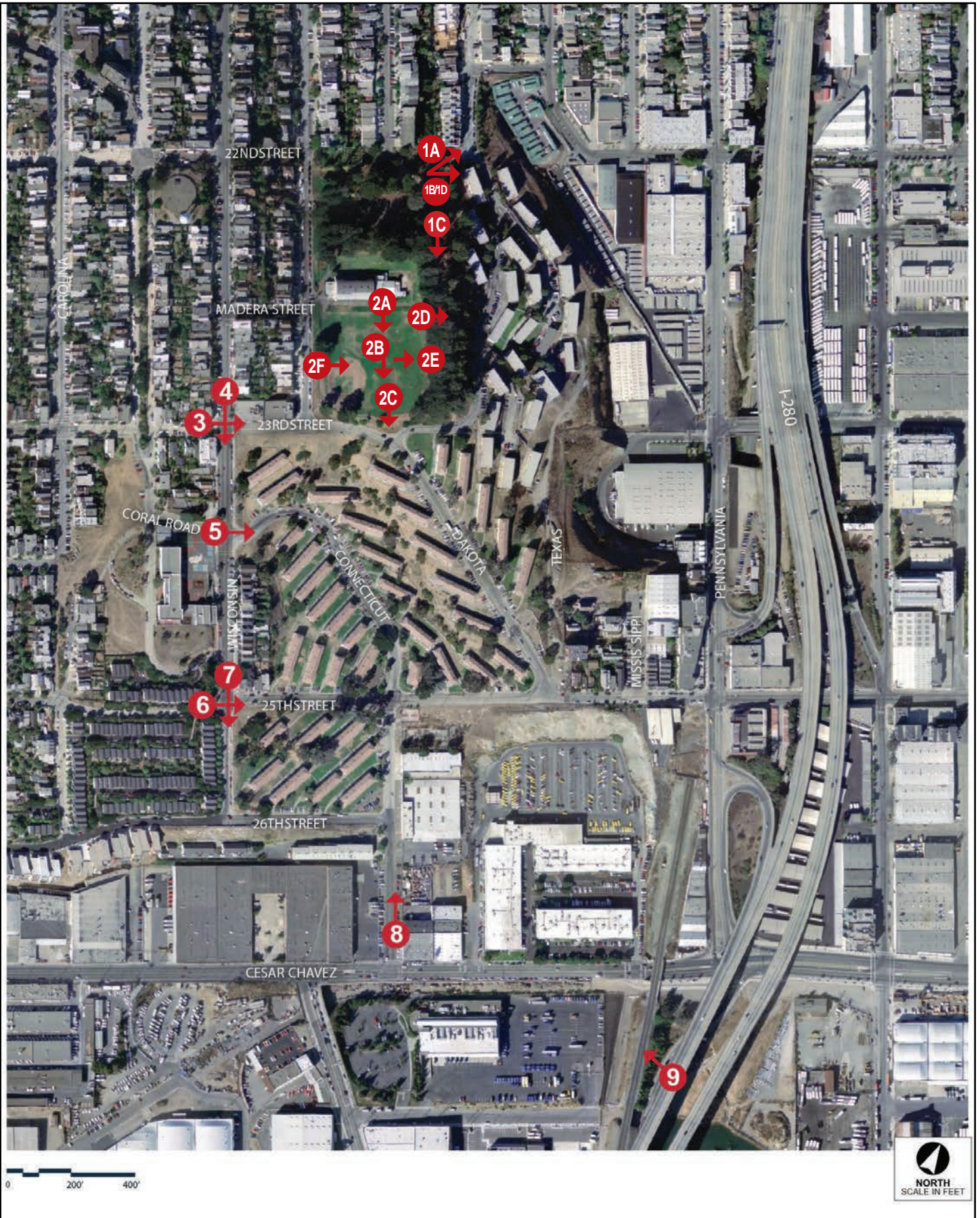
Features that are visible from the Project site, looking east and south, include: warehouse and industrial buildings with massive footprints that are relatively low in height; residential buildings and associated landscaping in the Bayview, Bernal Heights, Glen Park, Visitación Valley, and Dogpatch neighborhoods; the Hunters Point Shipyard and its shipping cranes and docks; India Basin and its bayside factory buildings and smokestacks; the Islais Creek Channel; Candlestick Point and the football stadium. The areas adjacent to the Bay and at the base of Potrero Hill are relatively flat; however, there are several higher elevation hills and ridges visible including Hunters Point Hill, Bayview Hill, Mount St. Joseph, and John McLaren Park and Ridge. The visual pattern as viewed from the Project site is relatively consistent manmade development; however, I-280 travels through the middleground view, visually encroaching on the area and dividing the development.

- Foreground or middleground views are limited from the Project site because views are mainly of local development, which is not considered a significant visual resource that limits views beyond. However, middleground views exist from the higher elevation hills and ridges in the Project area.
- Long-range scenic vista views are extensive, allowing views to the background, and include many significant areas within the City as well as areas beyond the City in the East Bay and the San Francisco Peninsula (Peninsula). Looking north from the Annex site, the high-rise buildings of the San Francisco Financial District are visible next to the southern towers of the Bay Bridge and Treasure Island. To the east, the Project site has unobstructed views of the Bay, the East Bay Hills and the East Bay cities along the Bay, including the City of Oakland and its financial district. Facing south, the northern slope of San Bruno Mountain is visible beyond John McLaren Ridge and the Santa Cruz Mountain Range extends southward down the Peninsula. Depending on the viewer location, long-range views from publicly-accessible streets are generally only blocked by mature

trees or the on-site dwelling units; otherwise these long range views tend to be broad and unobstructed.

Just as many areas are visible from the Project site, the Project site is visible from several surrounding areas. Figure 4.3-1 depicts a photo location map of various viewpoints in the vicinity of the Project site. For discussion purposes, the viewpoints are categorized under the following headers: Potrero Hill Recreation Center and 22nd Street Trail (Viewpoints 1 and 2), Local Streets Surrounding the Project Site (Viewpoints 3 through 8), and I-280 (Viewpoint 9). Given the high visibility from public view corridors to the Project site, these locations are considered sensitive viewpoints that are described in more detail below. Figure 4.3-2 through Figure 4.3-10 show the corresponding photos that illustrate the existing visual character of the Project site, view corridors, and viewsheds to and from the Project site. To provide clarity, the following table illustrates which figure numbers correspond to viewpoints.

Table 4-3-1 List of Figures and Viewpoints			
<i>Figure</i>	<i>ID</i>	<i>Location</i>	<i>Description</i>
4.3-2	1A	22 nd Street Trail	Looking northeast
	1B		Looking southeast
4.3-3	1C	22 nd Street Trail	Looking south
	1D	Bench below tennis courts	Looking east
4.3-4	2A	Potrero Hill Recreation Center	Looking south from northern edge of playfields
	2B		Looking south from middle of playfields
4.3-5	2C		Looking south from southern edge of playfields
	2D		Looking east from eastern edge of playfields
4.3-6	2E		Looking east from middle of playfields
	2F		Looking east from northwestern edge of playfields
4.3-7	3	23 rd Street and Wisconsin Street	Looking east
	4		Looking south
4.3-8	5	24 th Street and Wisconsin Street	Looking east
	6	25 th Street and Wisconsin Street	Looking east
4.3-9	7	25 th Street and Wisconsin Street	Looking south
	8	Connecticut Street at Cesar Chavez Street	Looking south
4.3-10	9	I-280	Looking west



SOURCE: Van Meter Williams Pollack LLP, 2015.

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 ● FIGURE 4.3-1: (REVISED) VIEWPOINTS LOCATION MAP



1A

A. 22nd Street Trail, looking north.



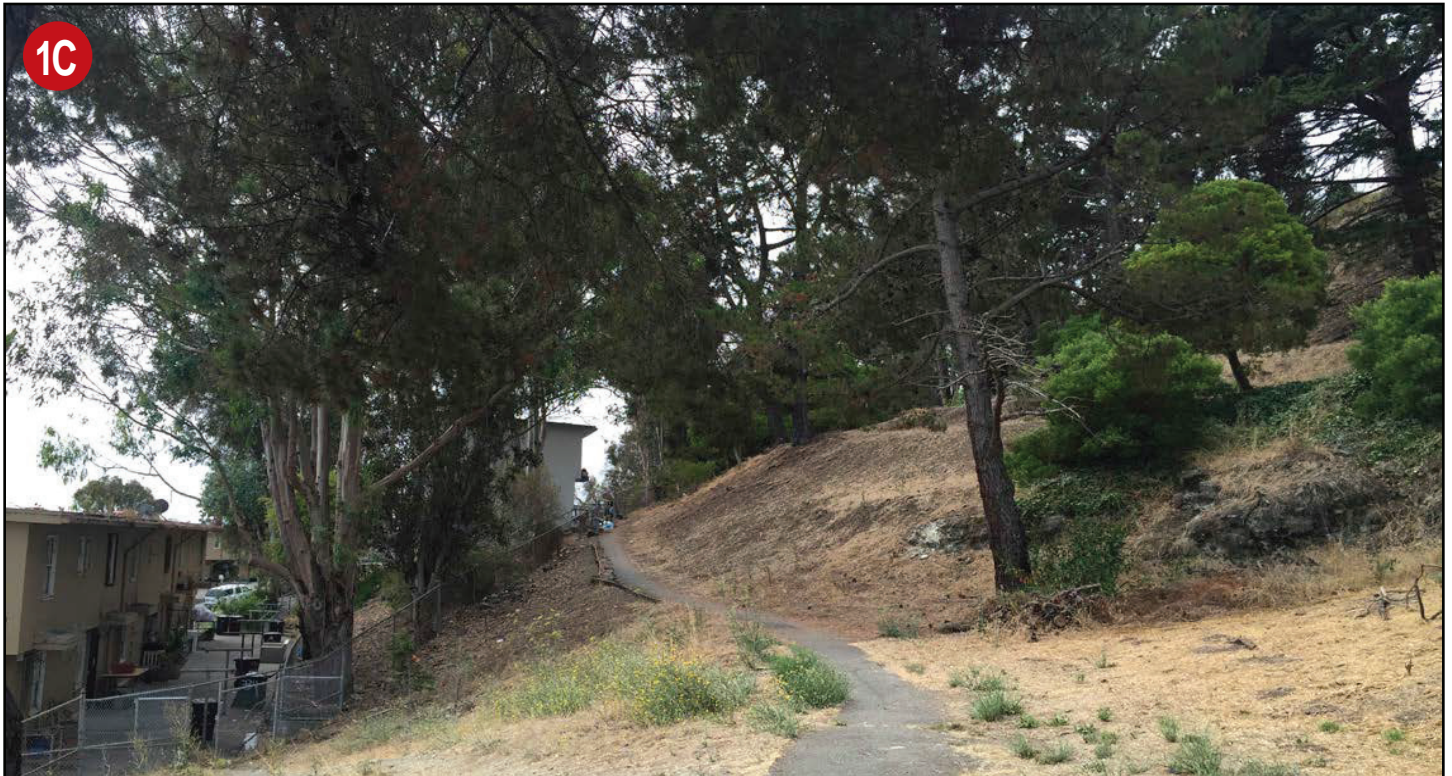
1B

B. 22nd Street Trail, looking southeast.

SOURCE: Van Meter Williams Pollack LLP., 2015.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)

● FIGURE 4.3-2: (REVISED) EXISTING VIEWS (VIEWPOINTS 1A AND 1B)



1C

A. 22nd Street Trail, looking south.



1D

B. Bench below tennis courts, looking east.

SOURCE: Van Meter Williams Pollack LLP., 2015.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)

● FIGURE 4.3-3: (REVISED) EXISTING VIEWS (VIEWPOINTS 1C AND 1D)



A. Potrero Hill Recreation Center, looking south from northern edge of playfields.

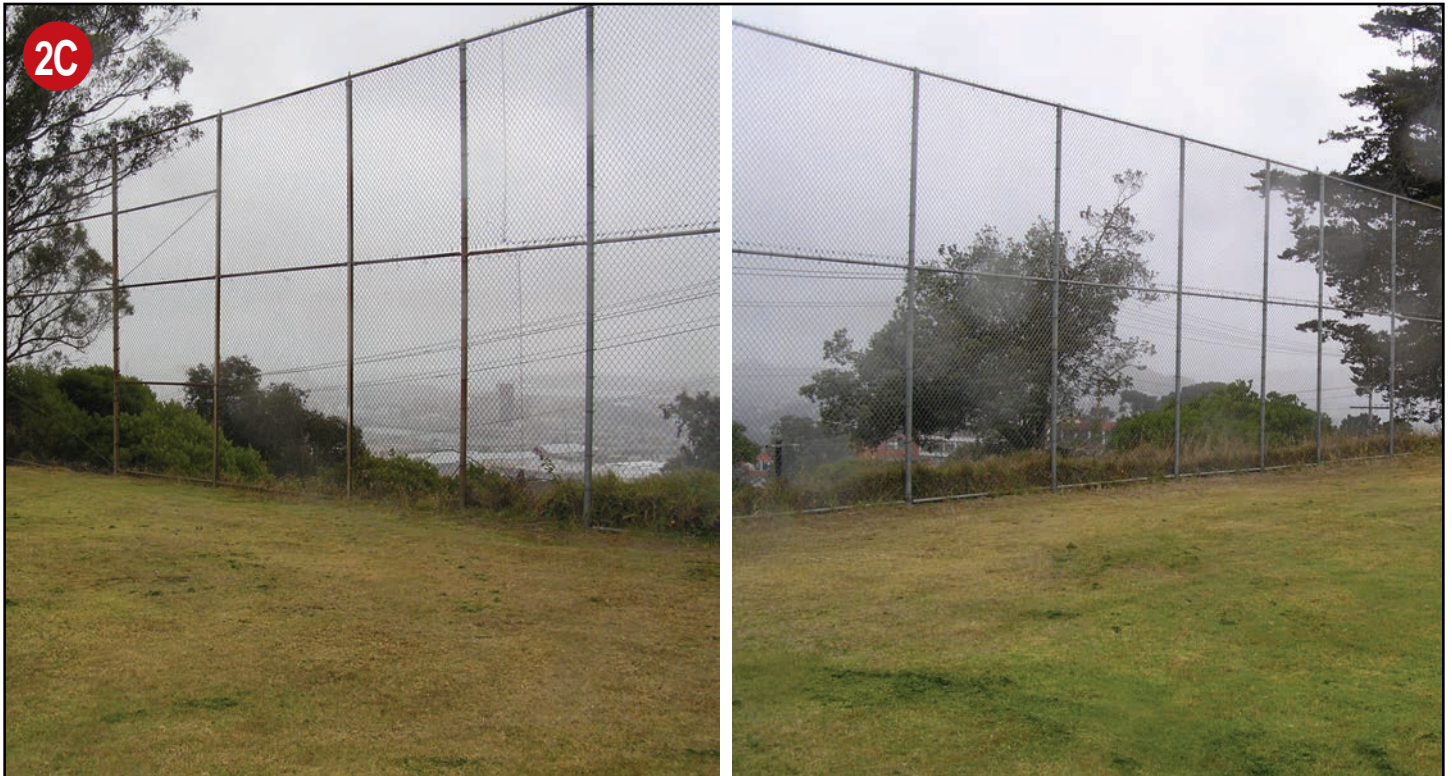


B. Potrero Hill Recreation Center, looking south from middle of playfields.

SOURCE: Van Meter Williams Pollack LLP., 2015.

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● **FIGURE 4.3-4: (REVISED) EXISTING VIEWS (VIEWPOINTS 2A AND 2B)**



A. Potrero Hill Recreation Center, looking south from southern edge of playfields.



B. Potrero Hill Recreation Center, looking east from western edge of playfields.

SOURCE: Van Meter Williams Pollack LLP., 2015.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)

● **FIGURE 4.3-5: (REVISED) EXISTING VIEWS (VIEWPOINTS 2C AND 2D)**



A. Potrero Hill Recreation Center, looking east from middle of playfields.



B. Potrero Hill Recreation Center, looking east from the northeastern edge of the playfields.

SOURCE: Van Meter Williams Pollack LLP., 2015.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)

● FIGURE 4.3-6: (REVISED) EXISTING VIEWS (VIEWPOINTS 2E AND 2F)



A. 23rd Street at Wisconsin Street, Looking East



B. 23rd Street at Wisconsin Street, Looking South

SOURCE: Van Meter Williams Pollack LLP, 2012.



A. 24th Street at Wisconsin Street, Looking East



B. 25th Street at Wisconsin Street, Looking East

SOURCE: Van Meter Williams Pollack LLP, 2012.



A. Wisconsin Street at 25th Street, Looking South



B. Connecticut Street at Cesar Chavez Street, Looking South

SOURCE: Van Meter Williams Pollack LLP, 2012.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)

● FIGURE 4.3-9: (REVISED) EXISTING VIEWS (VIEWPOINTS 7 AND 8)

9



I-280, Looking West towards Project Site

SOURCE: Van Meter Williams Pollack LLP, 2012.

Potrero Hill Recreation Center. The Potrero Hill Recreation Center is a 9.6-acre facility owned and operated by the San Francisco Recreation and Parks Department. This park includes a playground, baseball field, basketball court, dog play area, ball fields, two lighted tennis courts, picnic tables, and a recreation center with a gymnasium, stage, and auditorium.⁶ The Recreation Center is surrounded by a chain-link fence and dense mature trees, and sits atop a high retaining wall. Due to these features and the higher elevation, the Recreation Center is not a dominant characteristic visible from the lower neighborhood and the Project site. From the upper portion of the Project site, along 23rd Street, only the perimeter chain-link fence, mature trees, and retaining walls associated with the Recreation Center are visible. In addition, since the Recreation Center is uphill from the Terrace and Annex housing developments and features dense vegetation along the eastern perimeter, the existing buildings are not currently visible to park users.

○ Scenic vista views of the Bay and surrounding hills are present at the eastern and southern perimeter of the Potrero Hill Recreation Center. Although these views are not formally designated as scenic vistas, they are popularly used and appreciated areas of aesthetics or recreational significance at the local level. Figures 4.3-2 and 4.3-3 (Viewpoint 1A, 1B, and 1C) show the existing views from the 22nd Street Trail north of the Recreation Center. Middleground features include the surrounding urban industrial and residential development at lower elevations and dense vegetation along the perimeter of the trail. Background views of the Bay and the East Bay Hills, beyond, are provided looking north to southeast. Views looking along the trail (View 1C) south are mostly limited to the foreground by existing Potrero Annex buildings and dense vegetation along the edges of the trail. Middleground and background views of the Bay and the East Bay Hills, beyond, are not available looking in this direction (View 1C). However, intact, vivid, and largely unobstructed views of downtown San Francisco's skyline are offered looking north, that contribute to the panoramic nature of the views from the 22nd Street Trail. There is a moderate level of visual intactness between the natural areas (the Bay and East Bay Hills) and developed landscape looking southeast. Although the portions of the built environment blend into the overall surrounding character, some elements of existing development (at Potrero Annex) visually encroach onto the natural landscape pattern of the Bay and East Bay Hills resulting in a visual discontinuity and disruption. While views from Viewpoint 1C do not contribute greatly, views from Viewpoints 1A and 1B form a vivid and distinctive panoramic visual pattern. Visual quality is considered high from this location and viewer sensitivity to changes in views from the trail would also be high.

As shown in Figure 4.3-3 (Viewpoint 1D), the existing development at Potrero Annex is not readily visible in views looking east from the bench below the tennis courts. Middleground and background views of the surrounding Bay and East Bay Hills, rather, are the focal point in views that are available through gaps in the hillside vegetation. Visual quality is considered moderate from this

⁶ City and County of San Francisco, San Francisco Recreation and Parks Department. *Full Service Rec Centers: Potrero Hill Recreation Center*. Available: <<http://sfrecpark.org/Rec-RecCenters.aspx#/?i=2>>. Accessed: May 7, 2012.

location due to obscured views and viewer sensitivity to changes in views looking east would be moderately high.

Figures 4.3-4 through 4.3-6 (Viewpoints 2A through 2F) show existing views to the south and east from the playfields at the Potrero Hill Recreation Center. Viewpoints 2A, 2B, and 2C (Figures 4.3-4 and 4.3-5) show the existing views from looking south from various points on the playfields. Although partially blocked by the chain-linked fence, dense vegetation along the perimeter of the Recreation Center, and utility pole and wires, long-range views of the surrounding higher elevations to the south can be seen from these locations, including McLaren Ridge and San Bruno Mountain. These locations offer relatively intact views of the McLaren Ridge and San Bruno Mountain. Views from the playfields offer distinctive patterns and moderately defined landscapes. Some elements of the existing development visually encroach onto the natural landscape pattern of the McLaren Ridge and San Bruno Mountain resulting in a visual disruption, but the majority of the natural landscape area rises above the manmade development and visual order is maintained. Visual quality is considered moderately high from this location and viewer sensitivity to changes in views from the Potrero Hill Recreation Center would also be high. However, such views are common in the Project vicinity and the surrounding Bay area.

As shown in Figures 4.3-5 and 4.3-6 (Viewpoints 2D, 2E, and 2F), views looking east from the playfields show adjacent vegetation with long-range views of the East Bay Hills beyond. Development that is present to the east of the Potrero Hill Recreation Center is not visible from these viewpoints due to the steep slope on the eastern edge of the playfields. Visual quality is considered moderately high from this location and viewer sensitivity to changes in views looking east from the playfields would also be high. However, such views are common in the Project vicinity and the surrounding Bay area.

Local Streets Surrounding the Project Site. According to the Urban Design Element of the General Plan, views along streets should be protected, especially when the Bay is visible.⁷ Figure 4.3-7 through Figure 4.3-9 (Viewpoints 3 through 7), represent viewpoints along Wisconsin Street. View corridors are present toward San Bruno Mountain and the Bay, usually when traveling downhill; however, view corridors in the Project vicinity tend to be highly channelized by mature trees and development along the roadway corridor, with a high presence of utility lines, as seen in Viewpoints 3 through 7. Views from these locations are not considered scenic because such views are very common to the Project vicinity and do not contain uniquely vivid visual elements.

From the corner of Wisconsin Street and 23rd Street at Viewpoints 3 and 4 (Figure 4.3-7A and B), views of the existing housing development at the Terrace site are also available but views are limited to a few rooftops due to the hillside. Figure 4.3-8A (Viewpoint 5) shows the existing view from the corner of Wisconsin Street and Coral Road, facing east. The dominant features visible from

⁷ City and County of San Francisco, *San Francisco General Plan, Urban Design Element* (adopted December 7, 2010). Available: <http://www.sf-planning.org/ftp/General_Plan/I5_Urban_Design.htm>. Accessed: May 7, 2012.

this viewpoint are the mature trees at the Terrace site, but the view also includes street pavement and overhead wires, along with partially blocked views of the buildings at the Terrace site and the Bay. A view corridor of the Bay is visible between existing vegetation and the buildings at the Project site. This vantage point also represents the view from Starr King Elementary School.

Further down the street at the corner of Wisconsin Street and 25th Street, views of the Bay are more

- prominent as seen in Figure 4.3-8B (Viewpoint 6). Views of the Bay and nearby manmade features, such as the cranes associated with the San Francisco Port operations, are visible but are partially blocked by vegetation, utility poles and wires, and foreground and middleground development. The dense, single-family and multifamily units along 25th Street, which are not part of the Project site, are also visible in the foreground. The East Bay Hills provide background views on clear days.
- Looking south from Viewpoint 7, as shown in Figure 4.3-9A, the Project site is visible to the east although no existing housing units can be seen due to the topography. Also in the foreground, to the west, are the townhouses of the Parkview Heights development. Although mainly blocked by dense vegetation, some of the townhome façades and entry staircases are visible. Further to the south, the area provides channelized views of the industrial development at the base of Potrero Hill, I-280, Mount St. Joseph, Candlestick Hill, and San Bruno Mountain.
- Figure 4.3-9B (Viewpoint 8) shows the existing interior view of the Project site looking north at Cesar Chavez Street and Connecticut Street. Due to the steep terrain, several Terrace buildings are visible and appear to be staggered on the hillside between mature trees. To the west of Connecticut Street, the buildings seem denser, with no mature trees between the housing units. However on the east side of Connecticut Street, the buildings are more intermittently spaced, with dense trees between the structures, blocking several buildings from view. Although the Project site is highly visible from this location, it would not be considered a sensitive viewer location since the area consists of warehouses and industrial uses with no housing units present. In addition, views looking south (away from the Project site) are relatively level until Cesar Chavez Street, providing no views of the Bay or other significant natural features. Although there is a drop in elevation to the south of Cesar Chavez, no scenic views are held from Viewpoint 8, looking south.
- Viewpoints 3 through 8 represent views that are very common to the Project vicinity, do not contain elements that constitute a uniquely vivid view, and contain detracting visual elements such as many utility lines. Therefore, views from these locations are considered to have moderate visual quality. Viewer sensitivity is considered moderately high because while no scenic views are seen from these locations, viewers are likely to have a high sense of ownership over the local landscape and associated views.

I-280. I-280 is designated as an eligible state scenic highway from the State Route (SR) 17 interchange in San Jose to the I-80 interchange in San Francisco under the state's Scenic Highway Program.⁸

⁸ California Department of Transportation, Scenic Highway Program, *Eligible (E) and Officially Designated (OD) Routes*. Available: <<http://www.dot.ca.gov/hq/LandArch/scenic/cahisys4.htm>>. Accessed: May 7, 2012).

Scenic highways are highways that traverse land with unique or outstanding scenic quality or provide access to regionally significant scenic and recreational areas.

Unobstructed views of the Annex site are visible from southbound and northbound I-280 near Pennsylvania Avenue and 23rd Street. Industrial and warehouse buildings and storage units are located at the base of Potrero Hill in this area. The hill rises almost vertically above the industrial parcels and the housing units are perched within the hillside, towards the top. Behind the Annex Site, the extremely mature, dense trees at the Potrero Hill Recreation Center are visible. To the south of the Annex site, a few of the higher elevation Terrace buildings can be seen behind tall trees. Figure 4.3-10 (Viewpoint 9) shows the interior view of the Project site from Pennsylvania Avenue and 23rd Street. This view is similar from I-280 except in this location the housing development is more level with the viewer's line-of-sight and the utility poles and wires are not a dominant feature.

The Terrace site is also visible from I-280, but due to its south-facing direction on the hillside, it is not immediately visible to motorists. Southbound vehicles do not have a direct view of the Terrace site since warehouse buildings and other residential development blocks the site. Once the site is visible, the motorists are driving away from the site. Northbound vehicles have direct views of the Project site, but due to distance and intervening development, topography, and vegetation, the Terrace site blends with its surroundings and is not a dominant feature. The visual quality of views toward the Project site are considered moderate from this location and, because viewers are traveling past the Project site at high rates of speed and with brief views of the Project site, viewer sensitivity to changes at the Project site is considered moderately low.

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4.4 SOCIOECONOMICS AND COMMUNITY/POPULATION AND HOUSING

4.4.1 Introduction

This section presents the population and housing and socioeconomic setting for the Project site. As shown in Figure 4.4-1, the Project site is within U.S. Census Bureau Tract 614, which is generally bordered by 20th Street and 22nd Street to the north, I-280 to the east, 25th Street and 26th Street to the south, and US 101 to the west. The Project site is also part of the larger Showplace Square/Potrero neighborhood, as identified in the General Plan. This section compares data for the Proposed Project with that of the City and County of San Francisco, Census Tract 614, and the greater Showplace Square/Potrero neighborhood. A small portion of the Project site known as Block X is within Census Tract 9809. Block X is currently vacant and Census Tract 9809 consists primarily of industrial land uses. For these reasons, and because Census Tract 614 is more representative of the existing and proposed land uses, Census Tract 9809 is not included in the discussion below.

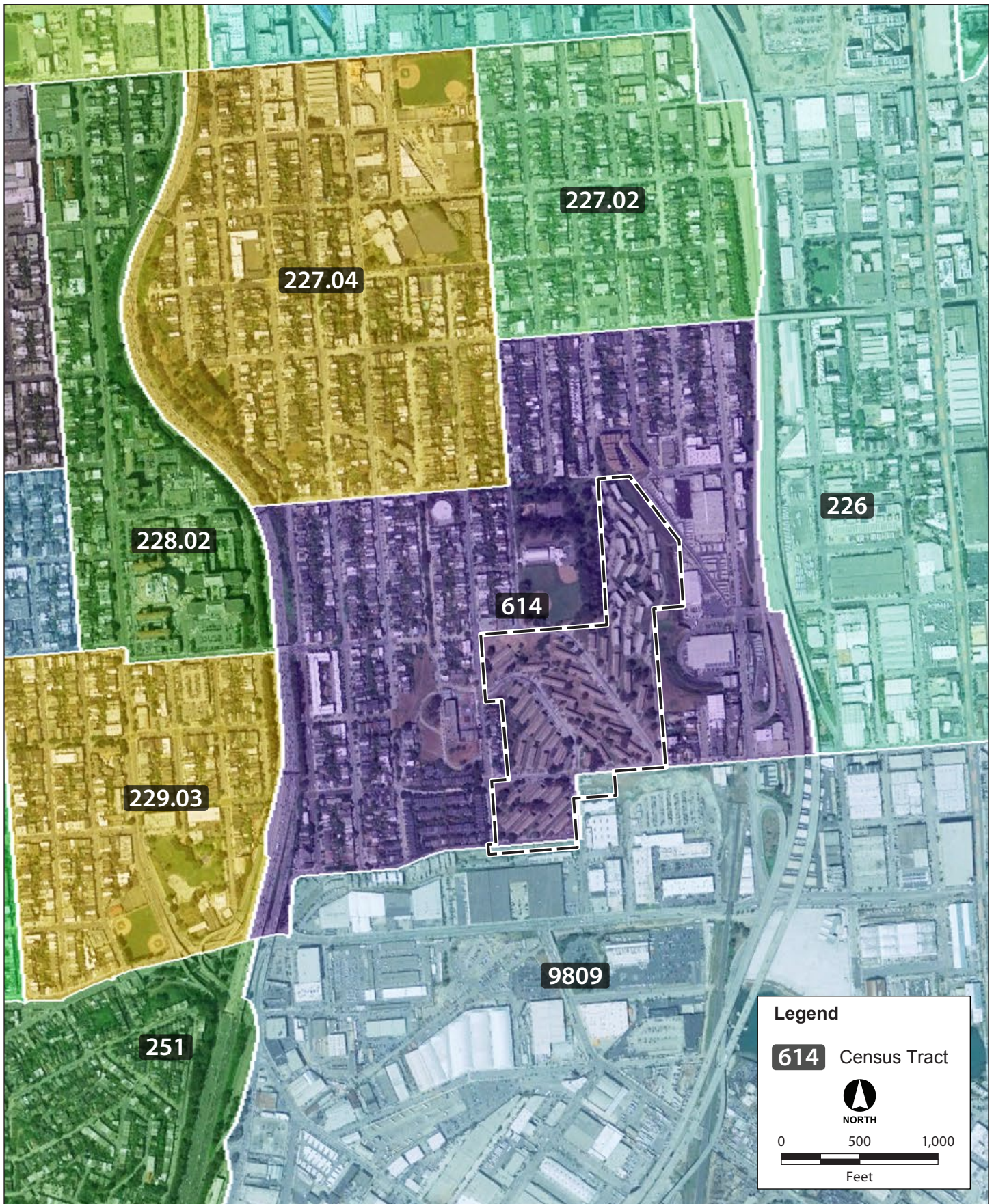
Several population and housing-related issues were raised during the Notice of Preparation (NOP) and Notice of Intent scoping periods. Specifically, concerns were made regarding the distribution of affordable and market rate housing within the site, the development intensity, and potential displacement of existing residents. Section 5.4, *Socioeconomics and Community/Population and Housing*, discusses the housing affordability levels in more detail, and addresses the issue of potential displacement. The potential secondary effects resulting from an increase in density on the Project site are discussed throughout this document.

4.4.2 Population

The Association of Bay Area Governments (ABAG) conducts long-term forecasts of population, households, and employment for the nine-county San Francisco Bay Area (Bay Area),¹ in order to project growth in the region. The analysis in this Draft EIR/EIS relies on ABAG *Projections 2009*² which were the most recent available at the time the NOP was published. As discussed in Part I of the 2009 Housing Element, adopted on March 24, 2011, the Planning Department completed a citywide projection effort, allocating growth throughout the city through 2030 to accommodate the adopted ABAG *Projections 2009* target.

¹ The Bay Area is defined as the nine counties that make up the region: Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco counties.

² Association for Bay Area Governments. 2009. *Projections and Priorities 2009, San Francisco Bay Area Population, Household, and Job Forecasts*. Data from Projections 2009 were included in Part I of the 2009 City of San Francisco Housing Element.



SOURCES: U.S. Census Bureau 2014 (<http://www.census.gov/2010census/popmap/>, accessed 2-6-2014), San Francisco Data (<https://data.sfgov.org/>, accessed 2-6-2014).

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FIGURE 4.4-1: CENSUS TRACTS IN THE PROJECT AREA

Table 4.4-1 presents 2010 Census population data and ABAG population projections for 2010 through 2030 in the city. According to the 2010 Census, the population in the nine-county Bay Area region was approximately 7.15 million residents. By 2030, the population in the Bay Area region is projected to reach over 8.7 million, an increase of approximately 21.9 percent over a 20-year period (2010 to 2030). In comparison, the 2010 Census population for San Francisco was 805,235 residents.³ According to ABAG projections, San Francisco is expected to reach a population of approximately 934,800 by 2030, a growth of approximately 16.1 percent between 2010 and 2030.

	Census Tract 614	City/County of San Francisco					Growth (2010-2030)
	2010^a	2010^b	2015^c	2020^c	2025^c	2030^c	
Population	5,395	805,235	837,500	867,100	900,500	934,800	129,565 (16.1%)

SOURCES:

- a. U.S. Census (2010).
- b. U.S. Census (2010).
- c. ABAG, *Projections 2009*.

As stated above, and included in Table 4.4-1, the Project site is within U.S. Census Bureau Tract 614. As of 2010, there were approximately 5,395 residents living in this census tract.⁴ The Project site is also within the Showplace Square/Potrero neighborhood, as identified in the General Plan (refer to Chapter 3, *Plans and Policies*, for more information regarding the Showplace Square/Potrero Area Plan). The production of affordable housing in order to provide housing for residents who are overburdened by their housing costs is one of the main goals of the Showplace Square/Potrero Area Plan. This neighborhood is home to over 11,000 residents,⁵ or approximately 1.4 percent of the City's total population in 2010.

4.4.3 Housing

The number of housing units and households⁶ within the Bay Area has increased substantially since the 1960s and growth is projected to continue through 2030.⁷ The number of households within the

³ U.S. Census Bureau. 2012. *American Fact Finder, Table DP-1, "Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data," Geography: San Francisco County, California.* Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed: April 24, 2012.

⁴ U.S. Census Bureau. 2012. *American Fact Finder, Table DP-1, "Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data," Geography: Census Tract 614, San Francisco County, California.* Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed April 24, 2012.

⁵ City and County of San Francisco Planning Department. 2008. *San Francisco General Plan, Showplace Square/Potrero Area Plan, adopted by the Board of Supervisors as Ordinance No. 297-08.* December. Available: <http://www.sf-planning.org/ftp/General_Plan/Showplace_Square_Potrero.htm#SHP_HSG>. Accessed April 25, 2012.

⁶ ABAG defines a "household" as "... another term for an occupied dwelling unit. A household includes all persons who occupy a housing unit. A housing unit is a group of rooms or a single room occupied as separate living quarters where occupants live separately from other persons in the building and have direct access from outside the building or through a common hall. A household can include more than one family." Source: ABAG Projections 2009, CD Appendix p. 13.

Bay Area is projected to increase from approximately 2.67 million in 2010 to 3.2 million in 2030, for a total growth rate of 18.9 percent. Similarly, the household population is expected to increase by 19.0 percent over this same period.

Table 4.4-2 presents the existing household population, households, and average household size for the City and County of San Francisco and Census Tract 614. In addition, this table shows the projected growth trends between 2010 and 2030 for the city. Currently, there are 345,811 households in the city,⁸ and it is projected that household growth will continue through 2030, for a total of 400,700 households. This growth over the 20-year period equates to an overall increase of approximately 54,889 households, a 13.7 percent increase from 2010.⁹ As shown in Table 4.4-2, San Francisco had a persons-per-household ratio of 2.26 in 2010. According to the 2010 Census, San Francisco had a total of approximately 376,942 housing units in 2010, with a vacancy rate of 8.3 percent.¹⁰

Table 4.4-2 Household Population and Household Growth in Census Tract 614 and the City and County of San Francisco 2010–2030

	<i>Census Tract 614</i>	<i>City/County of San Francisco</i>					<i>Growth (2010–2030)</i>
	<i>2010^a</i>	<i>2010^b</i>	<i>2015^c</i>	<i>2020^c</i>	<i>2025^c</i>	<i>2030^c</i>	
Household Population	5,387	780,971	816,400	845,800	879,200	913,000	132,029 (14.5%)
Households	2,354	345,811	359,170	372,750	386,800	400,700	54,889 (13.7%)
Average Household Size	2.29	2.26	2.27	2.27	2.27	2.28	-

SOURCES:

- a. U.S. Census (2010).
- b. U.S. Census (2010).
- c. ABAG, *Projections 2009*.

Table 4.4-2 also shows the current household population, households, and average household size within Census Tract 614. According to the 2010 Census, Census Tract 614 includes a household population of 5,387 and approximately 2,354 households, for an average persons-per-household ratio of approximately 2.29. This ratio is slightly higher than the citywide ratio of 2.26 persons per household. The Showplace Square/Potrero neighborhood, which includes the Project site, contains

⁷ Association for Bay Area Governments. 2009. *Projections and Priorities 2009, San Francisco Bay Area Population, Household, and Job Forecasts*. San Francisco, CA.

⁸ U.S. Census Bureau. 2012. *American Fact Finder, Table DP-1, "Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data," Geography: San Francisco County, California*. Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed: April 24, 2012.

⁹ Association for Bay Area Governments. 2009. *Projections and Priorities 2009, San Francisco Bay Area Population, Household, and Job Forecasts*. San Francisco, CA.

¹⁰ U.S. Census Bureau. 2012. *American Fact Finder, Table DP-1, "Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data," Geography: San Francisco County, California*. Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed: April 24, 2012.

more than 5,000 households, the majority of which are concentrated on Potrero Hill.¹¹ This equates to approximately 2.15 persons per household. As such, the persons per household ratio for the Showplace Square/Potrero neighborhood is slightly lower than the averages for the city and Census Tract 614.¹²

Table 4.4-3 presents the structure type, unit size, and age of housing in the City and County of San Francisco and Census Tract 614 in 2010.^{13,14} The housing units in San Francisco consist of roughly equal proportions of low-density (single-family units), medium-density (two to nine units), and high-density structures (structures with 10 or more units). In comparison, Census Tract 614 consists of more medium-density units (approximately 43.4 percent) and fewer high-density units (approximately 22.2 percent). In addition, as shown in Table 4.4-3, the largest percentage of housing stock in both the city and Census Tract 614 was built prior to 1940.

Table 4.4-3 San Francisco City and County Housing Characteristics		
Characteristics	Units in Census Tract 614 (2010)	Units in City/County (2010)
Structure Type		
Low Density (Single Family)	34.5%	31.5%
Medium Density (2–9 units)	43.4%	33.8%
High Density (10 or more units)	22.2%	34.7%
Other	0.0%	0.1%
Age of Housing by Year Built		
2000 and later	11.6%	6.4%
1980–1999	25.9%	9.9%
1960–1979	3.5%	14.7%
1940–1959	21.9%	20.6%
1939 or earlier	37.1%	48.4%
SOURCE: U.S. Census Bureau (2012).		

¹¹ City and County of San Francisco Planning Department. 2008. *San Francisco General Plan, Showplace Square/Potrero Area Plan, adopted by the Board of Supervisors as Ordinance No. 297-08*. December. Available: <http://www.sf-planning.org/ftp/General_Plan/Showplace_Square_Potrero.htm#SHP_HSG>. Accessed: April 25, 2012.

¹² City and County of San Francisco Planning Department. 2007. *Eastern Neighborhoods and Rezoning Area Plans Draft EIR, Case No. 2004.0160E, Table 19, "Population in the Eastern Neighborhoods and in San Francisco, 2000."* p. 181. June 30. Available: <<http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=3975>>. Accessed April 25, 2012.

¹³ U.S. Census Bureau. 2012. *American Fact Finder, CP04, "Selected Housing Characteristics 2006-2010 American Community Survey 1-Year Estimate," Geography: San Francisco County, California*. Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed: April 24, 2012.

¹⁴ U.S. Census Bureau. 2012. *American Fact Finder, DP04, "Selected Housing Characteristics 2006-2010 American Community Survey 5-Year Estimate," Geography: Census Tract 614, San Francisco County, California*. Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed: April 24, 2012.

The Project site itself currently comprises two of the oldest public housing developments in San Francisco, Potrero Terrace and Potrero Annex, built in 1941 and 1955, respectively. Combined, these public housing developments include a population of approximately 1,280 people in 517 households, resulting in a ratio of approximately 2.5 persons per household. All 517 households are considered to be affordable housing.¹⁵ Currently, 85 percent of the existing units are occupied, but this number fluctuates constantly.

■ **Regional Housing Needs Allocation**

Housing affordability is a major issue for the Bay Area and especially for San Francisco. According to ABAG, in 2007, only 15 percent of Bay Area households could afford a median-priced home in the Bay Area region, while only 10 percent of households in San Francisco could afford a median-priced home. Projections indicate that housing affordability will remain a major regional issue.¹⁶

New housing need is determined, in part, through a Regional Housing Needs Allocation (RHNA) process. ABAG, in coordination with the California Department of Housing and Community Development (HCD), determined the Bay Area's regional housing need based on regional trends, projected job growth, and existing needs. The housing needs determination effort seeks to alleviate a tight housing market stemming from forecasted household and employment growth as well as to allocate regional household and employment growth to jurisdictions with established or planned transit infrastructures. The RHNA determination includes production targets for housing to serve various household income categories. The RHNA provides a benchmark for evaluating the adequacy of local zoning and regulatory actions to ensure each local government is sufficiently designating land and providing opportunities for housing development to address population growth and job generation.

Table 4.4-4 shows the housing need allocated to the City of San Francisco by ABAG for 2007 to 2014. According to the RHNA, the Bay Area's overall housing need is approximately 214,500 new residential dwelling units, of which San Francisco's share is a total of 31,193 units, or 4,159 units per year over this time period. As shown, approximately 38.8 percent of the units should be in the low to very low household income category.

¹⁵ Bridge Housing. 2013. *Rebuild Potrero Community Assessment—Executive Summary*. October. San Francisco, CA.

¹⁶ Association of Bay Area Governments. 2008. *San Francisco Bay Area Housing Needs Plan 2007–2014*. June. p. 5. Available: <<http://www.abag.ca.gov/planning/pdfs/SFHousingNeedsPlan.pdf>>. Accessed: April 25, 2012.

Table 4.4-4 ABAG Regional Housing Needs Allocation for San Francisco

<i>Household Income Category</i>	<i>Percentage of Area Median Income (AMI)</i>	<i>No. of Units</i>	<i>Percentage</i>
Very Low	< 50%	6,589	21.1
Low	51–80%	5,535	17.7
Moderate	81–120%	6,754	21.7
Above Moderate	> 120%	12,315	39.5
<i>Total</i>	—	31,193	100%

SOURCE: ABAG, San Francisco Bay Area Housing Needs Plan 2007–2014 (2008).

4.4.4 Employment

Table 4.4-5 shows that the total employment in San Francisco grew steadily from 1970 to 2000. However, the crash of the dot-com ventures, even with the subsequent recovery, and the recession shows a net job loss in the years between 2000 and 2010 of approximately 65,700 jobs. According to the U.S. Census American Community Survey (ACS), approximately 69 percent of San Francisco residents 16 years and older are in the labor force (but not necessarily actively working). Out of the residents who are considered to be in the labor force, there is an unemployment rate of 7.1 percent.¹⁷ In comparison, in Census Tract 614, approximately 75.6 percent of the residents over 16 years old are in the labor force, with an unemployment rate of 10.3 percent.¹⁸ Approximately 79 percent of the employment age residents at the Potrero Terrace and Potrero Annex are unemployed.¹⁹ ABAG forecasts an increase in San Francisco employment between 2010 and 2030. During the 2010 to 2020 period, ABAG projects 78,460 new jobs in San Francisco, approximately 13.8 percent growth. The job growth from 2020 to 2030 is projected to be 100,910 jobs, or approximately 15.6 percent.^{20,21}

¹⁷ According to the U. S. Census, “All civilians 16 years old and over are classified as unemployed if they (1) were neither ‘at work’ nor ‘with a job but not at work’ during the reference week, and (2) were actively looking for work during the last four weeks, and (3) were available to accept a job. Also included as unemployed are civilians who did not work at all during the reference week, were waiting to be called back to a job from which they had been laid off, and were available for work except for temporary illness.”

¹⁸ U.S. Census Bureau. 2012. *American Fact Finder, S2301, “Employment Status 2006–2010 American Community Survey 5-Year Estimate,” Geography: San Francisco County, California PLUS Census Tract 614, San Francisco County, California.* Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed: April 25, 2012.

¹⁹ Charmaine Curtis, Curtis Development & Consulting—electronic communication with Atkins, November 21, 2012.

²⁰ City and County of San Francisco Planning Department. 2011. *Part I: Data and Needs Analysis*. February. Available: <[http://housingelement2009.sfplanning.org/docs/Housing Element PartI Data Needs Assmt DRAFT3.pdf](http://housingelement2009.sfplanning.org/docs/Housing_Element_PartI_Data_Needs_Assmt_DRAFT3.pdf)>. Accessed: April 25, 2012.

²¹ Association for Bay Area Governments. 2009. *Projections and Priorities 2009, San Francisco Bay Area Population, Household, and Job Forecasts*. San Francisco, CA.

Year	Total No. of Jobs	Growth (Loss)	% Change
1990	579,180	26,980	4.9
2000	634,430	55,250	9.5
2010	568,730	(65,700)	-10.4
2020	647,190	78,460	13.8
2030	748,100	100,910	15.6

SOURCE: City and County of San Francisco Planning Department, Part I: Data and Needs Analysis (February 2011), Table I-8 at p. I.12 (U.S. Census Bureau 2000 and ABAG Projections 2009).

According to ABAG, almost all sectors of the local economy experienced net employment losses between the 2000 and 2010 census, with the greatest loss in “Professional and Managerial Services” (18 percent of this sector’s jobs) and “Manufacturing and Wholesale” employment (42.4 percent of this sector’s jobs). Job growth in the next 20 years is expected to be strongest in the “Professional and Managerial Services” industry (37,830 new jobs), followed by the “Health and Educational Services” category (27,590), and the “Art, Recreation, and Other Services” segment (26,470).²²

The Project site currently includes minimal employment opportunities, with approximately 15 on-site employees, including for the daycare center and the Family Resource Center. The Potrero Terrace includes two property managers, two eligibility workers, and five generalists/groundskeepers. The Potrero Annex provides employment for two property managers, two generalists/groundskeepers, and two employees at the childcare center.²³

²² City and County of San Francisco Planning Department. 2011. *Part I: Data and Needs Analysis*. February. Available: <http://housingelement2009.sfplanning.org/docs/Housing_Element_PartI_Data_Needs_Assmt_DRAFT3.pdf>. Accessed: April 25, 2012.

²³ Toni Autry, HOPE SF Project Manager, San Francisco Housing Authority, Housing Development and Modernization—electronic communication with Atkins (January 2, 2013).

4.5 ENVIRONMENTAL JUSTICE

4.5.1 Introduction

The U.S. Department of Housing and Urban Development (HUD) regulations, 24 CFR Parts 50 and 58, mandate compliance with Executive Order 12898 (EO 12898), *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, for HUD and/or HUD applicants.

HUD defines low-income through a comparison of annual household income for households of various sizes with the area median income. HUD defines income guidelines for extremely low income households (those with 30 percent or less of the area median income), very low-income households (those with 50 percent or less of the area median income) and low-income households (those with 80 percent or less of the area median income).

Low-income population is defined as any readily identifiable group of low-income persons who live in geographic proximity and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by the proposed program, policy, or activity.

Minority population is defined as any readily identifiable group of minority persons who live in geographic proximity and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed program, policy, or activity.

A *minority population* is considered to be present if the minority population percentage of the affected area is greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (census tracts are generally considered appropriate). Guidance from the Council on Environmental Quality (CEQ) states that “Minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.”¹

No comments related to environmental justice were received in response to the Notice of Preparation (NOP). Several comments were received on the Notice of Intent (NOI) for the Draft EIR/EIS related to environmental justice issues. These comments express concern regarding the potential for disproportionate impacts on ethnic minorities and low-income residents as a result of the proposed Project. Specifically, NOI comments are focused on disproportionate impacts related to

¹ Council on Environmental Quality (CEQ), Environmental Justice, Guidance under the National Environmental Policy Act (December 10, 1997).

displacement, segregation, public transit, and provision of public services. These issues are addressed in the following sections of this Draft EIR/EIS: 4.4 and 5.4, *Socioeconomic and Community/Population and Housing* (displacement); 4.2 and 5.2, *Land Use and Land Use Planning* (segregation); 4.7 and 5.7, *Transportation and Circulation* (public transit); and 4.14 and 5.14, *Public Services* (public services).

4.5.2 Environmental Setting

■ Low-Income Communities

Poverty Levels

The Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is in poverty.² In 2011, the federal poverty threshold for a family of four was \$22,350.³ As described above, HUD defines low-income households as those with 80 percent or less of the area median income. Project site-specific data were gathered from the San Francisco Housing Authority in order to determine the demographic and economic composition of the Project site.^{4, 5} To provide local, regional, and state context, similar data are provided for three adjacent (Census Tracts: 226, 227.02, 227.04, and 9809), the County of San Francisco, and the State. The census tracts are illustrated in Figure 4.4-1. Median household income and poverty statistics are shown in Table 4.5-1.

When compared to Census Tracts adjacent to the Project site and the County of San Francisco, existing residents at the Project site meet HUD's criteria for extremely low income. The median household income for the Project site is not available, and thus the average household income is utilized to determine the level of poverty on the site. As shown in Table 4.5-1, approximately 64 percent of the families on the Project site live below the poverty line. In comparison to the percentage of families below the poverty level in the adjacent census tracts, the Project site's percentage is approximately eight times higher than San Francisco and approximately six times higher than California.

² U.S. Census Bureau. 2013. *Poverty Thresholds*. Available: <http://www.census.gov/hhes/www/poverty/data/threshold/index.html>>. Accessed February 5, 2014.

³ U.S. Census Bureau. 2014. *Poverty Thresholds*. Available: <http://www.census.gov/hhes/www/poverty/data/threshld/>>. Accessed: February 5, 2014.

⁴ LFA Group. 2012. *HOPE SF Baseline Report*. June. San Francisco, CA.

⁵ San Francisco Housing Authority. 2013. *Rebuild Potrero Community Assessment*. October. San Francisco, CA.

Table 4.5-1 Study Area Household Income Statistics

	Project Site ²	Study Area				San Francisco County	California
		Census Tract 226	Census Tract 227.02	Census Tract 227.04	Census Tract 9809		
Households	517	944	1,052	1,717	182	375,861	13,667,226
Average Annual Household Income	\$14,028	\$171,792	\$185,756	\$173,768	\$147,732	\$107,520	\$85,265
Median Household Income	NA ³	\$129,122	\$140,000	\$143,846	\$156,613	\$73,802	\$61,400
Families below poverty level	64%	0%	2.1%	1.4%	14.5%	8.1%	11.5%
Individuals below poverty level	NA ³	2.6%	5.3%	4.2%	13.4%	13.2%	15.3%
Median Household Income in Comparison to County/State ¹	Extremely Low Income	–	–	–	–	–	–

SOURCES: LFA Group. 2012. HOPE SF Baseline Report. June. San Francisco, CA.
 San Francisco Housing Authority. 2013. *Rebuild Potrero Community Assessment*. October. San Francisco, CA.
 U.S. Census Bureau. 2013. *2008–2012 American Community Survey, 5-year*. Available: < <https://www.census.gov/acs/www/>.>

NOTE:

- 1 The Income Comparison in the bottom row was determined by comparing the median household income for each tract to the median income household income for San Francisco (\$73,802as noted in Table 4.5-1). Per HUD guidelines the following definitions were used: Low-Income – 51% to 80% of area median income; Very Low-Income – 31 to 50% of area median income; Extremely Low-Income – 30% or less of area median income.
- 2 Census Tract 614 contains the Project site and immediately surrounding areas. The data in this table represents only the Project site.
- 3 Data not available for the Project site.

Based on the HUD guidelines referenced in Table 4.5-1 and comparing the adjacent census tracts to the average annual household income in the city illustrates that all census tracts that surround the Project site are not considered low income. The average annual household income for the Project site is less than 30 percent of the surrounding census tracts. For this reason the project site is considered to be extremely low income. As such, the Project site is considered an environmental justice community on the basis of income.

■ Minority Communities

Table 4.5-2 shows the racial and ethnic profile of residents of the Project site and the surrounding Potrero Hill neighborhood compared to the profiles of the county and state as a whole. These data are based on population and housing statistics from the U.S. Census Bureau’s 2010 Census and demographic data provided by the San Francisco Housing Authority for the Project site.

The Project site comprises approximately 76 percent minority ethnic groups. As shown in Table 4.5-2, the percentage of minority groups at the Project site is substantially greater than in the surrounding census tracts (226, 227.02, 227.04, and 9809). Therefore, consistent with CEQ guidance on the definition of minority population, because more than 50 percent of the Project site population belongs to an ethnic minority group, the Project site is considered a minority population for the purposes of this analysis. Therefore, the Project site is designated as an environmental justice community on the basis of ethnicity.

Table 4.5-2 Study Area Race and Ethnicity Statistics (Percentage of Population)

Race/Ethnicity	Study Area					San Francisco County	California
	Project Site	Census Tract 226	Census Tract 227.02	Census Tract 227.04	Census Tract 9809		
White	24	74.6	77.6	77.1	61.4	48.5	57.6
African American	43	4.2	2.5	1.4	10.9	6.1	6.2
American Indian and Alaska Native	1	0.5	0.1	0.4	0.3	0.5	1.0
Asian	11	13.6	11.5	13.5	8.6	33.3	13
Native Hawaiian and other Pacific Islander	5	0.9	0.0	0.1	0.6	0.4	0.4
Other Race	15	2.3	3.3	2.0	13.4	6.6	17
Multiracial	1	4.0	5.1	5.6	4.9	4.7	4.9
<i>Total Minorities</i>	76	25.4	22.4	22.9	33.8	51.5	42.4

SOURCES: LFA Group. 2012. *HOPE SF Baseline Report*. June. San Francisco, CA.
San Francisco Housing Authority. 2013. *Rebuild Potrero Community Assessment*. October. San Francisco, CA.
U.S. Census Bureau. 2013. *2008–2012 American Community Survey, 5-year*. Available: <<https://www.census.gov/acs/www/>>.

■ Outreach to Low-Income and Minority Communities

Starting in mid-2008, the project applicant initiated an extensive public outreach process to engage residents of the Project site and the greater Potrero Hill neighborhood in the master planning efforts for the Proposed Project. The initial public workshops focused on design principles for the redevelopment of the Project site and established goals to guide the development of the Project alternatives. The Project alternatives were then presented during an all-day open house in May 2009. With approximately 76 percent of the population on the Project site fluent in English,⁶ the public meetings and community outreach were conducted in English. Input from residents of the existing Potrero housing complex was sought in over 30 workshops, presentations, and Project tours between summer 2008 and summer 2010, when the Environmental Evaluation application was submitted to the Planning Department.

Further, as described in Chapter 1, *Project Purpose, Need, and Objectives*, pursuant to CEQA, a NOP was issued on November 10, 2010, and a scoping meeting was held on November 22, 2010. The scoping meeting was open to the public (including residents of the Project site) and affected governmental agencies and provided an opportunity to present any environmental concerns regarding the Proposed Project. Pursuant to NEPA, on May 2, 2012, HUD published an NOI to prepare a Draft EIS (see Appendix 1) in the Federal Register to inform agencies and the general public that a joint Draft EIR/EIS was being prepared and invited comments on the scope and content of the document. The NOI provided contact information for City staff responsible for the NOI, and stated that a public scoping meeting would be held no less than 15 days following publication of the NOI. A scoping meeting was held on May 17, 2012. The NOI was mailed to local, state, and federal

⁶ San Francisco Housing Authority. 2013. *Rebuild Potrero Community Assessment*. October. San Francisco, CA.

agencies with an interest in the Proposed Project and/or jurisdiction over the Project site as well as individuals living within a 300-foot radius of the Project site.

The EIR/EIS is being distributed for a public comment period of no less than 45 days.

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4.6 CULTURAL AND PALEONTOLOGICAL RESOURCES

4.6.1 Introduction

This section briefly describes the prehistoric and historic setting of the Project area and the results of the cultural resources investigation conducted for the Proposed Project. Except where otherwise noted, the architectural history discussion in this section of the Draft EIR/EIS is based on the San Francisco Planning Department, Historic Resource Evaluation Response, 1095 Connecticut Street (Potrero Terrace/Annex), July 15, 2011; the Historical Resources Evaluation prepared by CIRCA: Historic Property Development, March 31, 2009; the Landscape Design Evaluation prepared by Carey & Co., March 31, 2011; and information from the Northwest Information Center (NWIC) of the California Historic Resource Information System. The archeological discussion is based on a Preliminary Archeological Review (PAR) prepared by the City in August 2010. The relevant historic and cultural reports are included in Appendix 4.6.

The analysis of cultural resources is guided by an existing Programmatic Agreement (PA) by and among the City and County of San Francisco, the California State Preservation Officer, and the Advisory Council on Historic Preservation regarding historic properties affected by the use of revenue from the Department of Housing and Urban Development Part 58 Programs. The PA establishes the City's Section 106 responsibilities for the administration of undertakings subject to regulation by 24 CFR 58 that may have an effect on historic properties. The City is required to comply with the stipulations set forth in the PA for all undertakings that (1) are assisted in whole or in part by revenues from U.S. Department of Housing and Urban Development programs subject to 24 CFR 58 and that (2) can result in changes in the character or use of any historic properties that are located in an undertaking's Area of Potential Effect (APE). The Proposed Project would receive funds subject to 24 CFR 58 and, thus, is subject to the stipulations of the PA.

No comments regarding potential cultural and paleontological resource impacts were received in response to the Notice of Preparation or the Notice of Intent for the Draft EIR/EIS.

4.6.2 Environmental Setting

■ Area of Potential Effect

As the Proposed Project (undertaking) involves the demolition and construction of housing owned and operated by the San Francisco Housing Authority (SFHA), Stipulation VI(C) of the PA applies. Stipulation VI(C) requires the City to determine and document the APE in accordance with 36 CFR 800.16(d) for all undertakings except for the rehabilitation of interior or exterior features [VI(A)] and improvements to infrastructure [VI(B)].

The APE is defined in 36 CFR 800.16(d) as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties or architectural resources, if any such resources exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

In accordance with this guidance, the Mayor's Office of Housing and Community Development (MOHCD), as the responsible agency under the National Historic Preservation Act, has determined the APE for the federal undertaking (Proposed Project) for both archaeological and historic architectural resources. The APE for archaeological resources is shown on Figure 4.6-1 and is limited to the boundaries of the Project site. The APE for archaeological resources was delineated to encompass all areas that would be subject to ground-disturbing construction activities. MOHCD based its determination of the APE for historic architectural resources on line of sight from the Project site; thus, the APE for historic architectural resources is larger than the Project site, as shown in Figure 4.6-2.

■ **Prehistoric Background**

The prehistory of the San Francisco Bay Area has been a subject of archaeological investigation for over a century. Most of the early archaeological work in the Bay Area can be attributed to Nels Nelson, who recorded 17 shellmound sites in San Francisco, and over 400 shellmound sites around the Bay Area between 1906 and 1908 (Nelson 1909). Some of the shellmounds Nelson recorded extend to a depth of 20 to 30 feet below the surface (Moratto 1984). Buried and dispersed by the rapid urban development of the Bay Area over the last 150 years, what is left of the stones, bones, and shells that compose these mounds are some of the only tangible remains of the numerous peoples who once inhabited this rich littoral environment over the past 10,000 years.

Cultural Chronology

Humans have inhabited what is now urban San Francisco for at least 6,000 years and the greater Bay Area for nearly 12,000 years. The earliest peoples to inhabit the San Francisco Bay Area were widespread, but sparse, populations of hunter-gatherers whose subsistence was based on large game, seeds, and nuts as evidenced by the presence of large projectile points and milling stones (*manos* and *metates*). These peoples lived in highly mobile bands that made less use of shoreline and wetlands resources than later prehistoric populations. Soon after 2000 B.P. (years before present), Utian (Miwok-Costanoan language family) speakers began to migrate into the Bay Area from the Central Valley, displacing the earlier Hokan language speaking populations.

The new inhabitants were bayshore- and marsh-adapted people who differed from the previous populations in a number of respects, including language; larger and more sedentary settlements; a subsistence based on acorns, shellfish, and small game; mortuary practices; personal ornaments; and perhaps the fabrication of coiled basketry. It is assumed that the Costanoan representatives of this Utian dispersal reached the northern end of the San Francisco peninsula no later than 2510 B.P.



SOURCE: Atkins, 2012.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.6-1: ARCHAEOLOGICAL AREA OF POTENTIAL EFFECT



SOURCE: Atkins, 2012.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.6-2: HISTORIC RESOURCE AREA OF POTENTIAL EFFECT

Early Holocene (11,000–8,000 B.P.)

Early Holocene human populations are known from a few Bay Area sites outside of San Francisco. Communities from this period were highly mobile hunter-gatherers. Early Holocene sites may contain handstones, milling slabs, cutting and scraping tools, bifaces, dietary remains, or human burials.

Middle Holocene (8,000–4,000 B.P.)

Middle Holocene sites are more widespread in the San Francisco Bay Area and are evidenced by substantial settlements, isolated burials, distinct cemeteries, milling slabs, mortars and pestles, and the fabrication and use of shell beads and other ornaments. Differences in burial treatment such as differential distribution of shell beads and ornaments are interpreted as evidence of possible social stratification. The expansion of San Francisco Bay's estuaries and tidal wetlands seems to have resulted in a shift toward coastal and maritime resource exploitation. San Francisco has one Middle Holocene site (CA-SFR-28), the remains of a young woman found in marsh deposits 75 feet below the surface.

Late Holocene (4,000–230 B.P.)

Previous archaeological investigations in San Francisco have identified large intact cultural deposits likely dating from 4000 to 230 B.P. During the Late Holocene, there was a general trend throughout California for groups to adapt to local environmental conditions. Shellmounds are the dominant type of site in the Bay Area from this period. Shellmounds are typically found near or along the open Bay and next to streams flowing into the Bay. There is growing evidence that shellmounds were planned, constructed landscapes on sites with ancestral, or at least mortuary, importance. Artifacts found in assemblages include stone net sinkers, pestles for grinding seeds and other plant material, bone tools manufactured from faunal remains, rectangular shell beads, stone arrowheads, and stone knives.

■ Historical Background

Brief History of the Area

Ethnography. The historical development of Potrero Hill and the surrounding area can be organized into several general historic periods. Before 1776, the Ohlone, a Native American people, occupied the San Francisco Peninsula during the pre-European contact era. For hundreds and perhaps thousands of years, the Ohlone lived in seasonal villages that ringed the bay, including near the creeks and shoreline that existed at the base of Potrero Hill (now filled). The Ohlone culture was dramatically changed and ultimately displaced by Europeans and Americans during the post-contact era, which largely obscures physical records of Ohlone history. No intact structures of pre-contact Ohlone origin are known to exist above current ground level in San Francisco.

Hispanic Period. The Hispanic period ranged from approximately 1776 to 1846. Starting with the establishment of a Spanish mission and colony in the current Mission District of San Francisco, and continuing through the period of Mexican California and the ranchos, Potrero Hill served as the *Potrero Nuevo*, or “new pasture.” During the Spanish mission period, Ohlone “neophytes” at Mission Dolores constructed a low wall to demarcate the Potrero Nuevo, where mission cattle grazed. After the independent nation of Mexico dissolved the former Spanish mission’s land holdings in 1834, Mexican ranchers continued the grazing tradition on the Potrero Nuevo, and they engaged in the lucrative international hide-and-tallow market. In 1844, Mexico granted exclusive use of the Potrero Nuevo to the de Haro family, whose patriarch was Francisco de Haro, an *alcalde* (mayor) of Yerba Buena Pueblo, which preceded the city of San Francisco. Except for construction of isolated adobe buildings and denuding of grasses by cattle, Potrero Hill continued in its natural state. No intact structures of Hispanic origin are known to exist above current ground level on Potrero Hill.¹

American Period. The Early American period ranged from approximately 1846 to 1906. Between U.S. expansion into California in 1846 and the Gold Rush that followed soon after, and the 1906 Earthquake and Fire, the north slopes of Potrero Hill developed considerably, while the south slopes remained difficult to access and develop. By 1850, American settler George Treat had fenced off Potrero Hill from the west (along the low wall that Ohlone neophytes had constructed to demarcate the Potrero Nuevo), and squatters gradually encroached onto the hill. For decades, the de Haro family pursued their legal claim to ownership of Potrero Nuevo, and final rejection of the de Haro claim by the U.S. cleared the way for full-scale development. Filling of creeks and shoreline, installation of streetcar lines, and expansion of urban infrastructure occurred earlier near the north slopes of Potrero Hill, which were closest to the developing city of San Francisco. By the end of the 19th century, north Potrero Hill was occupied by growing residential neighborhoods, while the more remote south slopes remained sparsely developed and rural in character. Various occupants of Potrero Hill, which at that time was still located adjacent to waterfront, engaged in maritime occupations such as boat building, outfitting, and fishing. Typical properties of the period, which are extant on the south slopes of Potrero Hill, include modest wood-framed houses designed in National vernacular, Italianate, and Stick architectural styles.

After the 1906 Earthquake and Fire, (which did not significantly affect Potrero Hill), a building boom occurred in all neighborhoods of the city. The refugee/post-disaster population that gravitated towards Potrero Hill during this time was working-class in character. During this time the nearby Bayshore Cut-off was completed in 1907, which provided greater access to the south base of Potrero Hill, and facilitated the installation of railroads and commercial/industrial development in the area (as well as increased filling of creeks and shoreline).

¹ San Francisco Chronicle, San Francisco: Potrero Hill, <http://www.sfgate.com/neighborhoods/sf/potrerohill/> (accessed April 25, 2012).

During the mid-20th century, the south slopes of Potrero Hill were characterized primarily by consolidation and development of large sites for government and public uses. Around the large Project site, such as the Potrero Terrace public housing complex, private residential construction continued to fill in open lots within the neighborhoods, with flats and apartments predominating. Throughout most of the 20th century, the base of Potrero Hill was predominantly occupied by manufacturing firms, such as US Steel, the Union Iron Workers, the Western Sugar Refinery, and Bethlehem Shipbuilding Company, while families lived further up the hill. A combination of deindustrialization and the Dot-Com boom of the late 1990s spurred the conversion of factories and warehouses into offices and housing.²

Public Housing in San Francisco³

Like many other local housing authorities, the history of SFHA begins with the United States Housing Act (USHA) of 1937. Empowered by this act, the California Legislature passed the Housing Authorities Law in 1938, which allowed local communities to create their own housing authorities and begin asking for federal funding. The SFHA was formed in 1938 and San Francisco was among the first California cities to request USHA funding.

In addition to requesting funds, the SFHA's initial efforts were directed toward determining how great the need for public housing was at the time. With the first survey indicating that 46,000 homes in San Francisco were "substandard," the agency planned 11 public housing projects with a total of 2,855 units.⁴ Potrero Terrace was among five public housing projects undertaken before the onset of World War II (WWII) and was completed and/or partially occupied before December 1941. Other projects that followed in the early 1950s tended to relate to the ongoing process of phasing out and disposing of temporary defense housing units that had been built during WWII. This was generally accomplished by providing new permanent housing near occupied temporary units, reusing land that had been recently cleared, or, in the case of Potrero Annex, building new units adjacent to older permanent ones.⁵

Potrero Terrace. Potrero Terrace was constructed in 1941 and designed in 1939 by Frederick H. Meyer, Warren C. Perry, and John Bakewell, Jr. Potrero Terrace consists of 469 units in 38 buildings. The development comprises 26 one-bedroom units, 387 two-bedroom units and 56 three-bedroom units. The buildings are rectangular in plan, constructed of reinforced, board-form concrete and topped by a hipped, mission tile roof. Due to the steep slopes at the development site, the buildings

² San Francisco Chronicle, San Francisco: Potrero Hill, <http://www.sfgate.com/neighborhoods/sf/potrerohill/> (accessed April 25, 2012).

³ CIRCA: Historic Property Development, *Historic Resources Evaluation, Evaluation Review and Update, Selected SFHA Properties* (March 31, 2009).

⁴ CIRCA: Historic Property Development, *Historic Resources Evaluation, Evaluation Review and Update, Selected SFHA Properties* (March 31, 2009).

⁵ Carey & Co., Inc., *Hunters View Housing Development: Historic Resources Evaluation* (July 26, 2001, and updated September 10, 2007), p. 7–11.

are two stories on the uphill side and three stories on the downhill side. The landscaping was designed by Thomas Church, one of the most influential mid-century landscape architects.

The Potrero Terrace was evaluated by the Planning Department to determine its eligibility for listing in the California Register of Historic Resources (CRHR). According to the Historic Resources Evaluation Response (HREER) prepared by the Planning Department, the Potrero Terrace development is eligible for listing based on its association with important events and architectural style and potentially eligible based on association with important people. Specifically, the Potrero Terrace development was one of the first “super-block” public housing complexes in San Francisco, and was occupied by WWII defense workers, both of which represent significant events in relation to the history of public housing in San Francisco and nationwide. Further, the HREER indicates that the Potrero Terrace development could be associated with the lives of important persons whose productive years may have occurred while living at Potrero Terrace. In addition, the Potrero Terrace development represents the work of significant historic architects, including Frederick C. Meyer, Warren C. Perry, and John Bakewell, Jr., and illustrates a successful example of a mid-20th century, “Mediterranean Hillside” public housing complex.⁶ However, to be considered a resource for the purposes of CEQA (and to be eligible for listing in the CRHR) as an individual resource or as a contributor to a historic district, a property must be significant under the CRHR criteria, and it must demonstrate integrity. As concluded in the HREER, Potrero Terrace does not retain integrity due to cumulative physical changes to the property and, therefore, is ineligible for listing in the CRHR.

In addition, CIRCA: Historic Property Development, conducted a Historical Resources Evaluation Report (Historical Evaluation) to assess the eligibility of Potrero Terrace for inclusion on the National Register of Historic Places (NRHP). According to the Historical Evaluation, a previous evaluation of the property by Carey & Co. in 2001 found Potrero Terrace ineligible for listing in the NRHP. The 2001 determination was made on the basis that the Potrero Terrace development was “neither architecturally remarkable nor associated with significant people or events.” Dr. Knox Mellon, the State Historic Preservation Officer (SHPO), supported this assessment in a letter dated September 25, 2001.⁷ The Historical Evaluation concurs with the determination made by Carey & Co. and supported by SHPO that the Potrero Housing development does not maintain sufficient historical significance and is ineligible for listing in the NRHP.

A similar evaluation was conducted by Carey and Co. in 2011 to determine the historic significance of the landscape design originally developed by Thomas Church at Potrero Terrace. The analysis determined that alterations to the original landscape at Potrero Terrace have substantially and adversely impacted the integrity of the landscape design to the extent that it no longer expresses

⁶ San Francisco Planning Department, Historic Resource Evaluation Response, 1095 Connecticut Street (Potrero Terrace/Annex), Case No. 2010.0515E (July 15, 2011).

⁷ CIRCA: Historic Property Development, *Historic Resources Evaluation, Evaluation Review and Update, Selected SFHA Properties* (March 31, 2009).

historical significance.⁸ The conclusions of the historic landscape analysis support the determination of ineligibility for listing on the CRHR based on lack of integrity.

Potrero Annex. Potrero Annex Housing was designed in 1952 by the architecture firm of Ward & Bolles and landscape architect Douglas Bayliss. Construction began in 1953 and the development was completed in 1954. The Potrero Annex site is located on marginal land that was chosen at the time because available sites were increasingly difficult to acquire. Both J. Francis Ward and John S. Bolles, lead architects for the Potrero Annex development, were prominent architects in San Francisco, most notable for their work on a number of high-end residential properties and the Ping Yuen public housing project, respectively. Douglas Bayliss is best known as one of the founders of the “California School” of landscape architecture and his work includes the San Francisco Civic Center Plaza and Washington Square in North Beach.⁹

Potrero Annex comprises 23 buildings containing 27 one-bedroom units, 46 two-bedroom units, 55 three bedroom units, 18 four-bedroom units, five five-bedroom units, and a child care center. The buildings are rectangular in shape with wood frames and flat roofs canted at a slight angle. The east-facing elevations have wood balconies with exposed joists and a closed clapboard rail at the second and third stories.

The Potrero Annex was also evaluated in the HRER under the same CRHR criteria. According to the HRER, the Potrero Annex development is potentially eligible for listing based on its association with people important in local, regional, or national history. The poet Allen Ginsberg is documented to have lived and worked in a Potrero Annex housing unit during the mid-1950s. However, the HRER could not confirm that the Potrero Annex development is an important representation of Allen Ginsberg’s historic contributions.¹⁰ As concluded in the HRER, Potrero Annex does not retain integrity due to cumulative physical changes to the property and, therefore, is ineligible for listing in the CRHR.

According to the evaluation prepared by Carey & Co. in 2001, the Potrero Annex development was found to be ineligible for listing in the NRHP under any of the established criteria. The Potrero Annex development was also found to lack integrity. Similar to the Potrero Terrace development, Dr. Knox Mellon, SHPO, supported this assessment in his September 25, 2001, letter to MOHCD. Further, the Historical Evaluation prepared by CIRCA in 2009 concurs with the previous determinations.

⁸ Carey & Co., Inc., *Potrero Terrace and Potrero Annex Housing Project, Thomas Church and Douglas Baylis Landscape Design* (March 31, 2011).

⁹ Carey & Co., Inc., *Historic Resources Evaluation, Potrero Annex Housing Development, San Francisco, California* (June 22, 2001), p. 9.

¹⁰ San Francisco Planning Department, *Historic Resource Evaluation Response, 1095 Connecticut Street (Potrero Terrace/Annex), Case No. 2010.0515E* (July 15, 2011).

A similar evaluation was conducted to determine the significance of the landscape architecture at Potrero Annex. An assessment of the historic significance of the landscape design originally developed by Douglas Bayliss was conducted by Carey & Co. in 2011. The analysis determined that alterations to the original landscape at Potrero Annex have substantially and adversely impacted the integrity of the landscape design to the extent that it no longer expresses historical significance.¹¹ The conclusions of the historic landscape analysis support the determination of ineligibility for listing on the CRHR based on lack of integrity.

■ **Archaeological Resources**

Prehistoric Archaeological Sites

Prehistoric archaeological sites in California are locations where Native Americans lived or carried out activities prior to European occupation in 1769. Prehistoric archaeological sites may contain artifacts, subsistence remains, midden, structural remains, and/or human burials. Artifacts include tools such as projectile points, scrapers, bone awls, and stone grinding implements, waste products from tool manufacture, and nonutilitarian objects such as shell beads, shell ornaments, bone whistles, and ceremonial stone objects. Subsistence remains include the inedible portions of foods, such as animal bone, shell, and charred seeds. Structural remains include features such as post holes, house floors, and fire hearths. Human burials most often are individual interments composed of the individual's physical remains either buried in their entirety or as cremations, and sometimes include grave offerings.

There are approximately 50 documented prehistoric sites in San Francisco. These prehistoric sites include several large settlement sites (inhabited up to 1,000 years), cemeteries, food-procurement camps, tool workshops, and historic-period indigenous sites. One indigenous site dated to nearly 6,000 years B.P. occurs 75 feet below the surface. In contrast to prehistoric shell mound sites found elsewhere in the Bay Area, many shell mounds discovered in San Francisco have remarkable integrity because they have been buried for several hundred years beneath native sand dune deposits, enabling the study of their use and significance in the final periods before their abandonment. The high density and number of prehistoric sites in San Francisco provide the opportunity to study them as regional and sub-regional systems.

Recent studies in the San Francisco Bay Area prehistory indicate that prehistoric sites sometimes occur in clusters with a primarily symbolic association with a focal shellmound of greater size and age. The importance of the primary shellmound may have been in the form of religious/funerary observances and burials even after its abandonment. Bay Area prehistoric shellmounds may have been planned, intentionally re-created structures (not merely inadvertent dietary refuse accumulations). Prehistoric shellmounds were sometimes constructed over preexisting cemeteries.

¹¹ Carey & Co., Inc., *Potrero Terrace and Potrero Annex Housing Project, Thomas Church and Douglas Baylis Landscape Design* (March 31, 2011).

Many Bay Area shell mounds were abandoned over the course of a relatively brief period. No prehistoric archaeological sites have been documented in the Project area.

Historic-Age Archaeological Sites

Historic-age archaeological sites in California are places where human activities were carried out during the historic period between 1769 up to 50 years ago. Some of these sites may be the result of Native American activities during the historic period, but most are the result of Spanish, Mexican, Asian, African-American, and Euro-American activities. Most historic archaeological sites are places where houses formerly existed and contain ceramic, metal, and glass refuse resulting from transport, preparation, presentation, and consumption of food. Such sites can also contain house foundations and structural remnants such as windowpane glass, lumber, and nails. Historical archaeological sites can also be nonresidential, reflecting agricultural, industrial, commercial, and other activities. No historic-age archaeological sites have been documented in the Project area.

Northwest Information Center Record Search

In accordance with the PA (Stipulations VII.A.2 and XI.B), a non-confidential records search was conducted for the Project site and a surrounding one-quarter-mile radius at the Northwest Information Center (NWIC) on October 24, 2011 (NWIC File Number 11-0390). The search included a review of the NRHP, the California Historical Resources Inventory, records of previously recorded cultural resources, records of previous field studies, and other historic maps and documents. The records search did not identify any previously recorded prehistoric or historic-era cultural resources or previous studies on the Project site.¹² The records search identified 16 historic properties and determined that there is low possibility of identifying Native American archaeological resources and a moderate to high possibility of identifying historic period archaeological resources within a 0.25-mile radius of the Project site.¹³ The NWIC recommended a qualified archaeologist conduct further archival and field study to identify cultural resources.

Native American Consultation

A search of the Native American Heritage Commission (NAHC) sacred lands database was requested on May 10, 2011, to determine if any Native American cultural resources are present in or near the vicinity of the Project site. The sacred lands database search did not indicate the presence of Native American cultural resources in the Project area. However, in its response, the NAHC noted that the absence of cultural resource information in the sacred lands database does not preclude the presence of cultural resources in the Project area. The NAHC recommends that additional sources of

¹² Jillian Guldenbrein, California Historical Resources Information System, NWIC (File No.: 11-0390) (October 24, 2011).

¹³ Jillian Guldenbrein, California Historical Resources Information System, NWIC (File No.: 11-0390) (October 24, 2011).

cultural resource information be searched for the Project area.¹⁴ The NAHC provided a list of Native Americans who may have knowledge of cultural resources in the Project area. The San Francisco Planning Department sent letters to individuals and organizations identified on the NAHC list and Native American coordination efforts will be ongoing throughout the planning and construction process.

■ **Historic Architectural Resources**

The PA (Paragraph D of Stipulation VII) requires the City to evaluate all properties that may be affected by an undertaking (the Proposed Project) using National Register Criteria set forth in 36 CFR Section 60.4. All such evaluations are to be documented by the City on a State of California Department of Parks and Recreation Historic Resources Inventory Form.

As described above, Potrero Terrace and Potrero Annex were determined to be ineligible for listing on the NRHP. The Historical Evaluation prepared by CIRCA in 2009 determined that the Project site was not historically significant based on National Register Criteria or the CRHR Criteria for Evaluation and, therefore, the Potrero Terrace and Potrero Annex buildings do not qualify as a historic property for the purposes of Section 106 and CEQA.

In accordance with the PA, all properties within the APE are evaluated to determine eligibility for listing on the NRHP or the CRHR. As a result of this evaluation, 15 properties were identified as potentially eligible based on age (greater than 50 years old) (Table 4.6-1). The Planning Department determined that two properties within the APE are eligible for listing on the NRHP. These properties include the single-family residence at 1033 Texas Street (on the basis of distinctive characteristics of a type, period, or method of construction) and Starr King Elementary School at 1106–1120 Wisconsin Street (on the basis of association with events that have made a significant contribution to the broad patterns of history and distinctive characteristics of a type, period, or method of construction). These findings were forwarded to the SHPO, who concurred on October 11, 2012, that the two identified properties are eligible for inclusion in the NRHP.

¹⁴ Debbie Pilas-Treadway, Native American Heritage Commission, Letter response to request for sacred lands file record search (June 10, 2011).

<i>Property Address</i>	<i>APN</i>	<i>Integrity</i>	<i>Significance</i>	<i>NR Status</i>	<i>CR Status</i>
801 Arkansas St		No	Ineligible	Ineligible	Ineligible
1920–2190 Cesar Chavez St	4324/002	No	Ineligible	Ineligible	Ineligible
1111 Connecticut St	4287/010	No	Ineligible	Ineligible	Ineligible
1056 Mississippi St	4224/021	No	Ineligible	Ineligible	Ineligible
1060 Mississippi St	4224/023	No	Ineligible	Ineligible	Ineligible
1033 Texas St	4224/036	Yes	Criterion C—Example of Folk Victorian architecture	Eligible	N/A
1051 Texas St	4224/034	No	Ineligible	Ineligible	Ineligible
980 Wisconsin St	4161/024	No	Ineligible	Ineligible	Ineligible
1026 Wisconsin St	4219/002	No	Ineligible	Ineligible	Ineligible
1040 Wisconsin St	4219/005	No	Ineligible	Ineligible	Ineligible
1106 Wisconsin St	4219/054	Yes	Criterion C—Example of Mid-Century Modern architecture	Eligible	N/A
1111 Wisconsin St	4220/039	No	Ineligible	Ineligible	Ineligible
1169 Wisconsin St	4220/030	No	Ineligible	Ineligible	Ineligible
1500 25 th St	4224/043	No	Ineligible	Ineligible	Ineligible
1998 25 th St	4220/028	No	Ineligible	Ineligible	Ineligible

SOURCE: Atkins (2012).

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4.7 TRANSPORTATION AND CIRCULATION

4.7.1 Introduction

The following section describes the transportation study area including roadways, intersections, public transit, and pedestrian/bicycle facilities that could be affected by the Proposed Action and alternatives. Unless otherwise noted, all information is from the transportation impact study (TIS) prepared for the project.¹ Comments received during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods included general transportation impacts, pedestrian-related impacts, impacts to transit, and effects on bicycle safety.

In addition, comments were submitted regarding parking impacts. However, as described on Section 1, *Project Purpose and Need*, Senate Bill (SB) 743 became effective on January 1, 2014. The Proposed Project is a qualifying infill project in a transit priority area; thus, no CEQA conclusions are provided in regard to parking. NEPA conclusions are provided. The parking-related comments made on the NOI and the NOP are addressed in Section 5.7 *Transportation and Circulation*.

4.7.2 Existing Conditions

■ Roadway Network

This section provides a description of the existing regional and local roadway network in the vicinity of the Project site, including the location of the nearest access points. Figure 4.7-1 shows the study area for the TIS and the intersection analysis locations.

Regional Access

United States Highway 101 (US 101) provides regional access to the project from the northern and southern counties. US 101 serves San Francisco, the Peninsula, the South Bay, and extends north via the Golden Gate Bridge to the North Bay. Within the northern part of San Francisco, sections of Lombard Street and Van Ness Avenue serve as US 101 along surface streets. Within the southern part of San Francisco and the Peninsula, US 101 is served via the Central Freeway and the Bayshore Freeway. In the project vicinity US 101 has four lanes in each direction. Access to the Project site from US 101 is primarily provided by on- and off-ramps located at Cesar Chavez Street.

¹ CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Prepared for City and County of San Francisco Planning Department, Case No. 2010.05151.



SOURCE: Potrero HOPE Transportation Study, June 2012.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.7-1: PROJECT STUDY AREA

Interstate 280 (I-280) provides regional access from the South of Market area of downtown San Francisco to the South Bay/Peninsula. In the project vicinity I-280 has three lanes in each direction. Access to the Proposed Project from northbound I-280 is provided via the off-ramp to Cesar Chavez Street and on-ramp from Indiana Street. From southbound I-280, access to the Project site is provided by on- and off-ramps at Pennsylvania Avenue. US 101 and I-280 have an interchange approximately 1.5 miles south of the Project site.

Interstate 80 (I-80) provides regional access to and from the East Bay to the Project site. I-80 connects San Francisco to the East Bay and extends east via the San Francisco-Oakland Bay Bridge. I-80 begins at the Central Freeway/US 101 and I-80 interchange, approximately 1 mile north of the Project site.

Local Access

This section describes the local roadway network in the vicinity of the project, including roadway designation, number of travel lanes, and traffic flow directions.

Cesar Chavez Street is an east/west roadway running from Douglass Street to Maryland Street located in the Port of San Francisco North Container Terminal. It operates as a local two-way roadway between Douglass Street and Guerrero Street with some interruptions, and as a major arterial eastward from Guerrero Street to Third Street. East of Third Street, Cesar Chavez Street acts as a secondary arterial that primarily serves port and pier activities in the area. In the vicinity of the Project site, Cesar Chavez Street has two lanes in either direction with on-street parking on both sides of the street. The *San Francisco General Plan* (General Plan) classifies Cesar Chavez Street as a Major Arterial in the Congestion Management Plan (CMP) Network from Guerrero Street to Third Street, a Secondary Arterial east of Third Street, and as part of the Metropolitan Transportation System (MTS) Network. Cesar Chavez Street is part of Citywide Bicycle Route 60 between Third Street and Sanchez Street. It is identified as a Route with Significant Truck Traffic east of US 101. On- and off-ramps to/from northbound and southbound US 101 can be accessed from Cesar Chavez Street. In addition, an off-ramp from northbound I-280 directly connects to Cesar Chavez Street.

Cesar Chavez Street from Hampshire to Guerrero Streets in the Mission District has been redesigned. The following elements are part of the Cesar Chavez Street Design Plan: widened and planted center median, bicycle lanes, corner bulb-outs, new street lighting, and drought tolerant landscaping. Construction was completed in February 2014.²

Potrero Avenue is a north/south roadway that runs between Brannan Street and Cesar Chavez Street. Potrero Avenue operates primarily as a two-way street its entire length and has a center turn lane. In the vicinity of the Project site, Potrero Avenue has two travel lanes and a five-foot wide bicycle lane in each direction, sidewalks and on-street parking on both sides of the street, and a

² Alex Murillo, Department of Public Works Affairs Officer. Telephone conversation with Nannie Turrell, San Francisco Planning Department, March 20, 2014.

bus/taxi-only lane in the northbound direction. North of 17th Street, Potrero Avenue generally has three travel lanes in each direction. The General Plan classifies Potrero Avenue as a Major Arterial in the CMP network, a MTS Network street, a Transit Preferential Street (secondary transit street), and a Neighborhood Commercial Street (from 24th Street to 26th Street). Potrero Avenue is part of Citywide Bicycle Route #25 between 17th Street and Cesar Chavez Street. Direct access to southbound US 101 from Potrero Avenue is available through a direct on-ramp.

Pennsylvania Avenue is a north/south roadway that runs between 17th Street and Cesar Chavez Street. In the vicinity of the Project site, Pennsylvania Avenue operates as a two-way street with one lane each way and either parallel or perpendicular parking on both sides of the street. On- and off-ramps to and from southbound I-280 are provided from Pennsylvania Avenue.

Third Street is a north/south roadway that runs between Market Street and Bayshore Boulevard. North of King Street, Third Street is a one-way northbound roadway, with four to six travel lanes, of which one lane is reserved for transit vehicles. South of King Street, Third Street generally has two travel lanes in each direction. On-street parking is generally provided along both sides of the street, subject to tow-away regulations. On-street parking on the east side of Third Street between King Street and Market Street and on the west side between Bryant Street and Market Street is subject to tow-away from 7:00 a.m. to 9:00 a.m. On-street parking is also prohibited on the east side of Third Street between Townsend Street and Market Street and on the west side between Bryant Street and Market Street (except between Harrison Street and Howard Street) from 3:00 p.m. and 7:00 p.m. In the vicinity of the Project site, Third Street operates as a two-way street with two lanes in each direction and a center median reserved for light-rail transit. The General Plan classifies Third Street as a Major Arterial in the CMP network, a MTS Network street, a Transit Preferential Street (primary transit street), a citywide Pedestrian Network Street, and a Neighborhood Commercial Street.

20th Street is a discontinuous east/west roadway that runs between Douglass Street (in Noe Valley) and east of Illinois Street, close to the San Francisco Bay. In the vicinity of the Project site, 20th Street operates as a two-way street with one travel lane in each direction. It has on-street parking and sidewalks on both sides of the street.

22nd Street is a discontinuous east/west roadway that runs between Grand View Avenue (in Noe Valley) and east of Illinois Street, near the San Francisco Bay. In the vicinity of the Project site, 22nd Street operates as a two-way street with one travel lane in each direction. It has on-street parking and sidewalks on both sides of the street.

23rd Street is an east/west roadway that runs between Grand View Avenue and east of Illinois Street, near the San Francisco Bay. West of I-280, it is discontinuous between Pennsylvania Avenue and Carolina Street. In the vicinity of the Project site, 23rd Street operates as a two-way street with one travel lane in each direction. It has on-street parking on both sides of the street, with discontinuous sidewalks located on one side of the street. 23rd Street is part of the Citywide Bicycle Route #525 between Potrero Avenue and Kansas Street.

25th Street is an east/west roadway that runs between Grand View Avenue and east of Michigan Street, near the San Francisco Bay. It is discontinuous across US 101. In the vicinity of the Project site, 25th Street operates as a two-way street with one travel lane in each direction. It has on-street parking on both sides of the street, with discontinuous sidewalks located on one side of the street.

26th Street is a discontinuous east/west roadway that runs from Douglass Street to Third Street. West of I-280, it is discontinuous between Pennsylvania Avenue and Connecticut Street, and between US 101 and Hampshire Street. In the vicinity of the Project site, 26th Street operates as a two-way street with one travel lane in each direction. It has on-street parking on both sides of the street, with discontinuous sidewalks located on one side of the street.

Wisconsin Street is a north/south roadway that runs between 16th Street and 26th Street. It is discontinuous between 17th Street and 19th Street. In the vicinity of the Project site, Wisconsin Street operates as a two-way street with one travel lane in each direction. It has on-street parallel and perpendicular parking, along with sidewalks on both sides of the street.

Arkansas Street is a north/south roadway that runs between 16th Street and 23rd Street. In the vicinity of the Project site, Arkansas Street operates as a two-way street with one travel lane in each direction, and on-street parking as well as sidewalks on both sides of the street.

Connecticut Street is a discontinuous local roadway that exists primarily within the vicinity of the Project site. Between 16th Street and 22nd Street, Connecticut Street is a north-south local roadway. Near the Project site, it runs as a westbound one-way east/west street between Wisconsin Street and 25th Street before turning into a two-way north-south street between 25th Street and Cesar Chavez Street. It has on-street parking and sidewalks on both sides of the street.

Missouri Street is a north/south roadway that runs between 16th Street and 23rd Street. In the vicinity of the Project site, Missouri Street operates as a two-way street with one travel lane in each direction, and on-street parking as well as sidewalks on both sides of the street.

Indiana Street is a north/south roadway that runs between Mariposa Street and Tulare Street. Indiana Street operates as a northbound one-way street between Cesar Chavez Street and 25th Street. At other locations, it operates as a two-way street with one lane each way and on-street parking on both sides of the street. An on-ramp to northbound I-280 can be accessed from Indiana Street. Indiana Street is part of Citywide Bicycle Route #7 between Cesar Chavez Street and Mariposa Street.

Vermont Street is a north/south roadway that runs between Division Street and Cesar Chavez Street. It is discontinuous across US 101. In the vicinity of the Project site, Vermont Street operates as a two-way street with one travel lane in each direction. On-street parking and sidewalks are provided on both sides of the street. Vermont Street is part of the Citywide Bicycle Route #525 between 26th Street and Cesar Chavez Street.

Dakota Street is a local north/south roadway within the Project site that runs between 23rd Street and 25th Street. Dakota Street operates as a two-way street with one travel lane in each direction. It has on-street parking and sidewalks on both sides of the street.

Texas Street is a north/south roadway that runs between 17th Street and 25th Street. Just north of 22nd Street, Texas Street merges with 22nd Street. South of 22nd Street, it is discontinuous and begins again just north of 25th Street. North of 22nd Street, Texas Street operates as a two-way street with one travel lane in each direction, and on-street parking as well as sidewalks on both sides of the street. South of 22nd Street, Texas Street operates as a local two-way street with a narrow travel lane in each direction. No sidewalks are provided along this portion of Texas Street.

Turner Terrace is a north/south roadway that runs southeast of Missouri Street, just south of 22nd Street. It is a cul-de-sac providing local access to housing units along the Potrero Annex. Turner Terrace operates as a two-way street with one travel lane in each direction and on-street parking on both sides of the street. A sidewalk runs along the west side of the street.

Watchman Way is a north/south roadway that runs southeast of Missouri Street, just south of Turner Terrace and northeast of 23rd Street. It is a cul-de-sac providing local access to housing units along the Potrero Annex. Watchman Way operates as a two-way street with one travel lane in each direction and on-street parking on both sides of the street. A sidewalk runs along the west side of the street.

Intersection Operating Conditions

Existing intersection operating conditions were evaluated for the peak hour of the weekday PM peak period (from 4:00 p.m. to 6:00 p.m.). Intersection turning movement counts at the following study intersections were collected on Tuesday, January 4, 2011:

1. Cesar Chavez Street/Connecticut Street
2. Cesar Chavez Street/Pennsylvania Avenue/Northbound I-280 Off-Ramp
3. Pennsylvania Avenue/Southbound I-280 Off-Ramp
4. 25th Street/Indiana Street/Northbound I-280 On-Ramp
5. 25th Street/Connecticut Street
6. 25th Street/Dakota Street/Texas Street
7. 23rd Street/Dakota Street
8. 23rd Street/Wisconsin Street
9. 20th Street/Arkansas Street
10. 22nd Street/Missouri Street
11. Potrero Avenue/23rd Street
12. Cesar Chavez Street/Vermont Street
13. Cesar Chavez Street/US 101 Off-Ramp

Traffic counts collected at the study intersections are included in Appendix 4.7, *Transportation*; the existing weekday PM peak hour turning movement volumes and geometric configurations of the study intersections are presented in Figure 4.7-2.

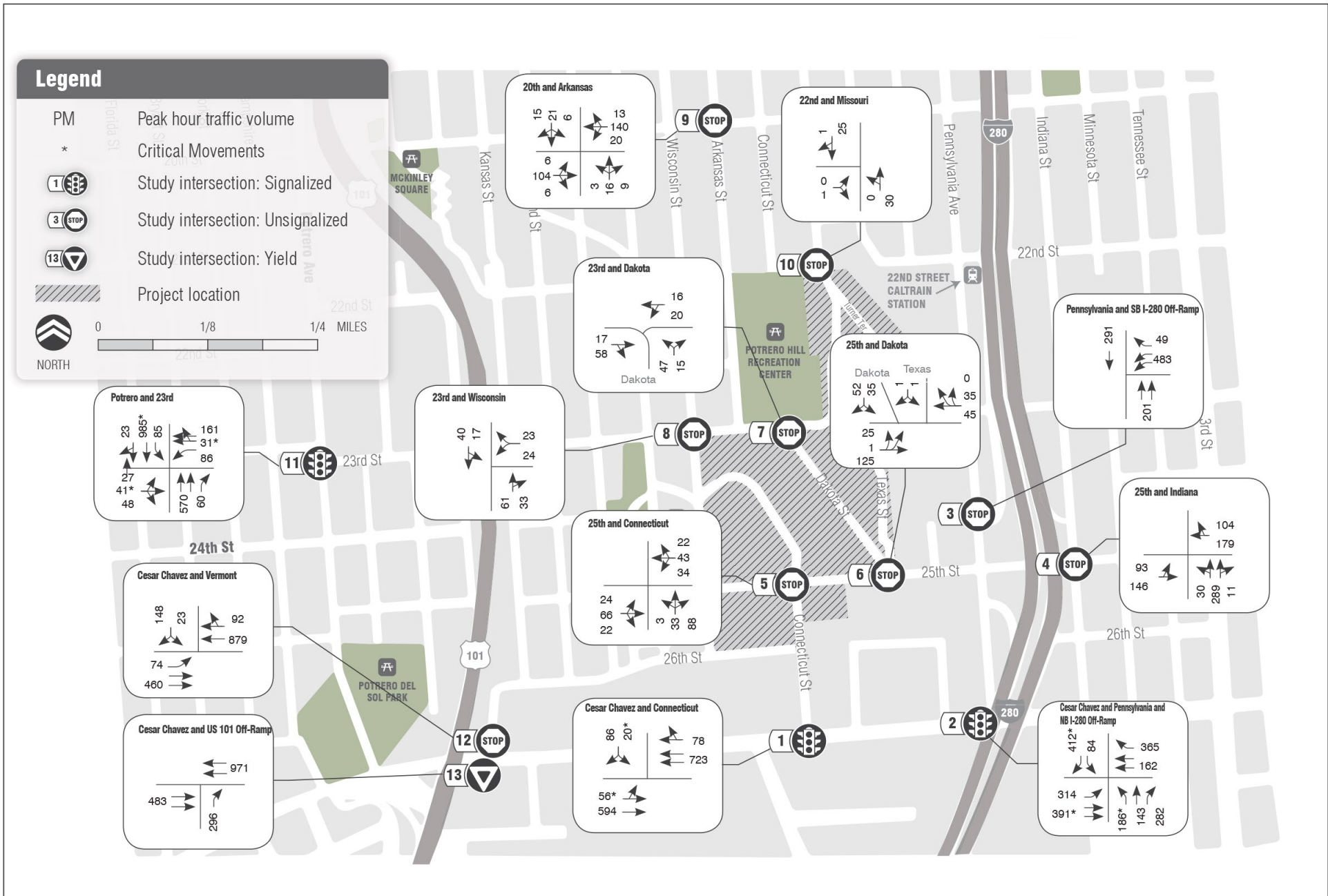
Within the project study area, three intersections (Cesar Chavez Street/Connecticut Street, Cesar Chavez Street/Pennsylvania Avenue/Northbound I-280 Off-Ramp, and Potrero Avenue/23rd Street) are signalized, five intersections (Pennsylvania Avenue/Southbound I-280 Off-Ramp, 25th Street/Indiana Street/Northbound I-280 On-Ramp, 25th Street/Connecticut Street, 23rd Street/Wisconsin Street, and 20th Street/Arkansas Street) are all-way stop-controlled, and four intersections (25th Street/Dakota Street/Texas Street, 23rd Street/Dakota Street, 22nd Street/Missouri Street, and Cesar Chavez Street/Vermont Street) are one- or two-way stop-controlled. The Cesar Chavez Street/US 101 Off-Ramp intersection is one-way yield-controlled.

The operating characteristics of signalized and unsignalized intersections are described by the concept of level of service (LOS). LOS is a qualitative description of the performance of an intersection based on the average delay per vehicle. Intersection levels of service ranges from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

Both signalized and unsignalized intersections were evaluated using the Highway Capacity Manual 2000 (HCM 2000) methodology. For signalized intersections, this methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS values are presented for the intersection. For unsignalized intersections, the average delay and LOS values are calculated by approach (e.g., northbound) and movement (e.g., northbound left-turn), for those movements that are subject to delay.

Appendix 4.7 includes the LOS definitions for signalized and unsignalized intersections. LOS A through D are generally considered satisfactory for signalized intersections, and LOS E and F are generally considered unsatisfactory. Unsignalized intersections are considered to operate under unsatisfactory conditions if the worst approach operates at LOS E or F and California Department of Transportation's (Caltrans) traffic signal warrants are met. As such, in the LOS summary tables, the operating conditions of unsignalized intersections are presented for the worst approach.

A summary of the study intersection operations during the existing weekday PM peak hour is provided in Table 4.7-1. During the weekday PM peak hour, all of the study intersections operate under acceptable conditions (LOS D or better). Detailed LOS calculation sheets for the study intersections are included in Appendix 4.7.



SOURCE: Potrero HOPE Transportation Study, June 2012.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.7-2: INTERSECTION VOLUMES AND GEOMETRIC CONFIGURATIONS—EXISTING PM PEAK HOUR

Table 4.7-1 Existing Intersection Operations—Weekday PM Peak Hour

#	Intersection	Traffic Control	Existing Conditions	
			Delay	LOS
Signalized				
1	Cesar Chavez St/Connecticut St	Signal	16.3	B
2	Cesar Chavez St/Pennsylvania Ave/NB I-280 Off-Ramp	Signal	38.4	D
11	Potrero Ave/23 rd St	Signal	22.2	C
Unsignalized				
3	Pennsylvania Ave/SB I-280 Off-Ramp	AWSC	15.2 (SB)	C
4	25 th St/Indiana St/NB I-280 On-Ramp	AWSC	11.4 (EB)	B
5	25 th St/Connecticut St	AWSC	8.0 (EB)	A
6	25 th St/Dakota St/Texas St	TWSC	9.6 (SEB)	A
7	23 rd St/Dakota St	OWSC	9.2 (NB)	A
8	23 rd St/Wisconsin St	AWSC	7.5 (SB)	A
9	20 th St/Arkansas St	AWSC	8.5 (WB)	A
10	22 nd St/Missouri St	OWSC	8.5 (EB)	A
12	Cesar Chavez St/Vermont St	TWSC	25.8 (SB)	D
13	Cesar Chavez St/US 101 Off-Ramp	OWYC	13.3 (NB)	B

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.

Signal = traffic signal; OWSC = one-way stop-controlled; TWSC = two-way stop-controlled; AWSC = all-way stop-controlled; OWYC = one-way yield-controlled

NB = northbound, SB = southbound, EB = eastbound, WB = westbound, SEB = southeast bound

Delay is presented in seconds per vehicle; for unsignalized intersections, delay and LOS values are presented for the worst approach, annotated in parentheses ().

Freeway and Ramp Junction Operating Conditions

Similar to intersections, study freeway segments and ramp junctions were evaluated during the weekday PM peak hour. Traffic volumes were obtained from Caltrans counts for years 2008/2009 at the following study freeway segments:

- Northbound I-280 (south of Cesar Chavez Street Off-Ramp)
- Southbound I-280 (south of Pennsylvania Avenue On-Ramp)
- Northbound I-280 (north of Indiana Street On-Ramp)
- Southbound I-280 (north of Pennsylvania Avenue Off-Ramp)
- Northbound US 101 (north of Cesar Chavez Street On-Ramp)
- Southbound US 101 (north of Cesar Chavez Street Off-Ramp)

In general, the latest available Caltrans counts for year 2010 were observed to be lower than those for years 2008/2009 within the study area. This temporary reduction in volumes is likely due to the economic recession. Therefore, for conservative purposes 2008/2009 traffic counts were used for analysis.

Similarly, ramp volumes for years 2008/2009 were obtained from Caltrans counts at the following ramps:

- Northbound I-280 off-ramp to Cesar Chavez Street
- Southbound I-280 off-ramp to Pennsylvania Avenue
- Northbound I-280 on-ramp from Indiana Street
- Southbound I-280 on-ramp from Pennsylvania Avenue

AM peak hour traffic volumes were observed to be either similar to or higher than the PM peak hour volumes at the following four (4) freeway segments:

- Northbound I-280 (south of Cesar Chavez Street Off-Ramp)
- Northbound I-280 (north of Indiana Street On-Ramp)
- Northbound US 101 (north of Cesar Chavez Street On-Ramp)
- Southbound US 101 (north of Cesar Chavez Street Off-Ramp)

Therefore, the above four freeway segments were evaluated for traffic impacts during the AM peak period as well.

Similar to intersections, freeway segments and ramp junctions were evaluated based on the HCM 2000 methodology. Diverge and merge analysis was performed at the ramp junctions. HCM 2000 methodology identifies LOS of the freeway segments and ramp junctions using average vehicle density as the measure of effectiveness. Freeway segment LOS values are calculated based on traffic volume, lane geometry, vehicle type, free-flow speed, and other characteristics. Adjustments are typically made to the base free-flow speed to account for lane width, number of lanes, interchange density, and lateral clearance. Using the flow rates and speed data, average vehicle density of the freeway segment is computed.

For ramp junctions, HCM methodology computes demand flow rate using traffic volume and lane geometry data, while applying adjustments to account for the peak hour factor (PHF), heavy vehicle factor, and driver population factor. Flow rates are computed immediately upstream of ramp influence area for both merging and diverging ramps. Determination of LOS is then identified by comparing the computed demand flow rate and capacity of the ramp influence area.

Similar to intersections, LOS values of freeway segments and ramp junctions range from LOS A to F. LOS A to LOS D represent acceptable conditions, while LOS E and F represent unacceptable conditions. LOS definitions for freeway segments and ramp junctions are included in Appendix 4.7.

Traffic volumes, densities, and corresponding LOS values for the study freeway segments during the existing weekday AM and PM peak hours are shown in Table 4.7-2. During the weekday AM peak hour, all of the study freeway segments operate at LOS D or better, except for Southbound US 101 (north of the Cesar Chavez Street Off-Ramp), which operates at LOS F.

Table 4.7-2 Existing Freeway Segment Operations—Weekday AM and PM Peak Hours

#	Study Freeway Segment	Volume ^a	Density	LOS
AM Peak Hour				
1	NB I-280 (south of Cesar Chavez St Off-Ramp)	5,123	34.4	D
3	NB I-280 (north of Indiana St On-Ramp)	4,644	22.9	C
5	NB US 101 (north of Cesar Chavez St On-Ramp)	6,170	30.4	D
6	SB US 101 (north of Cesar Chavez St Off-Ramp)	8,274	>45	F
PM Peak Hour				
1	NB I-280 (south of Cesar Chavez St Off-Ramp)	2,394	16.0	B
2	SB I-280 (south of Pennsylvania Ave On-Ramp)	4,375	29.3	D
3	NB I-280 (north of Indiana St On-Ramp)	2,669	13.1	B
4	SB I-280 (north of Pennsylvania Ave Off-Ramp)	4,877	32.6	D
5	NB US 101 (north of Cesar Chavez St On-Ramp)	8,426	>45	F
6	SB US 101 (north of Cesar Chavez St Off-Ramp)	6,754	33.4	D

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.

Density is reported in passenger cars per mile per lane (pc/mi/ln).

Bold indicates unacceptable conditions (LOS E or F).

^a Caltrans traffic counts (years 2008/2009).

During the weekday AM peak hour, all of the study freeway segments operate at LOS D or better, except for Southbound US 101 (north of the Cesar Chavez Street Off-Ramp). This freeway segment operates at LOS F.

During the existing weekday PM peak hour, all of the study freeway segments operate at LOS D or better, except for Northbound US 101 (north of the Cesar Chavez Street On-Ramp). This freeway segment operates at LOS F.

The study ramp junction operations during the existing weekday PM peak hour are shown in Table 4.7-3. During the existing weekday PM peak hour, all of the study ramp junctions operate under acceptable conditions (LOS D or better). Detailed LOS calculation sheets for the study freeway segments and ramp junctions are included in Appendix 4.7.

Table 4.7-3 Existing Ramp Junction Operations—Weekday PM Peak Hour

#	Study Ramp Junction	Volume ^a		Density	LOS
		Ramp	Freeway		
1	NB I-280/Cesar Chavez St Off-Ramp	731	2,394	4.8	A
2	SB I-280/Pennsylvania Ave Off-Ramp	482	4,877	29.4	D
3	NB I-280/Indiana St On-Ramp	366	2,303	17.0	B
4	SB I-280/Pennsylvania Ave On-Ramp	770	3,605	26.9	C

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.
Density is reported in passenger cars per mile per lane (pc/mi/ln).
a. Latest available Caltrans traffic counts (years 2008/2009).

Transit Network

The Project site is located in the southeast portion of San Francisco and is served by both local and regional public transit. Muni provides local transit service within the City and County of San Francisco as well as routes that travel along US 101 and I-280. Muni’s fleet consists of biodiesel and electric hybrid motor coaches, electric trolley coaches, light rail (Metro) vehicles, paratransit cabs and vans, and cable cars. The motor coach fleet used by Muni includes 30-foot small, 40-foot standard, and 60-foot articulated vehicles.

Regional service to and from the East Bay is provided by Bay Area Rapid Transit (BART), Alameda-Contra Costa Transit (AC Transit), and ferries; service to and from the South Bay/Peninsula is provided by BART, San Mateo Transit District (SamTrans), and Caltrain; service to and from the North Bay is provided by Golden Gate Transit (GGT) buses and ferries.

Study Area Service. Muni operates four bus lines (Routes 10 Townsend, 19 Polk, 22 Fillmore, and 48 Quintara-24th Street) and one light rail line (Line T) that directly serve the Project site and its immediate vicinity. The majority of these routes pass by and/or through the Project site (Figure 4.7-3). Routes 10, 19, and 48 are operated by Motor Coach Standard (MCS) vehicles, and the 22 Fillmore is operated by Trolley Coach Standard (TCS) vehicles.

There are approximately 15 Muni bus stops on or near the Project site, located along Arkansas Street, Wisconsin Street, 20th Street, 23rd Street, Dakota Street, 25th Street, 26th Street, and Connecticut Street as well as two Muni light rail stations located at the Third Street/20th Street and Third Street/23rd Street intersections.



SOURCE: Potrero HOPE Transportation Study, June 2012.

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FIGURE 4.7-3: EXISTING TRANSIT NETWORK

Within the Project site, there are 10 bus stops serving the 10 Townsend, 19 Polk, and 48 Quintara-24th Street routes; at the following locations:

- Northbound Wisconsin Street—south of 25th Street
- Northbound Wisconsin Street—north of 26th Street
- Southbound Wisconsin Street—south of Coral Street
- Southbound Connecticut Street—north of 26th Street
- Northbound Connecticut Street—between 25th and Wisconsin Streets
- Westbound 25th Street—east of Connecticut Street
- Eastbound 25th Street—west of Dakota Street
- Westbound 23rd Street—east of Wisconsin Street
- Dakota Street—between 25th and 23rd Streets
- Dakota Street—south of 23rd Street

All bus stops include either pole-type bus stops with or without on-road signage or bus stops marked only by paint on the roadway.

Existing Muni Corridor Analysis. The weekday service frequencies and the nearest stop locations for the Muni lines that serve the Project site are listed in Table 4.7-4. Service frequency and hours of operation reflect the changes in Muni service that were implemented in September 2010.

Table 4.7-4 Nearby Muni Service—Weekday Conditions						
<i>Route</i>	<i>Vehicle Type^c</i>	<i>Hours of Operation</i>	<i>Minimum Frequency (per hour)^b</i>			<i>Nearest Stop</i>
			<i>AM</i>	<i>MID</i>	<i>PM</i>	
10 Townsend	MCS	5:45 a.m.–7:15 p.m.	20	20	20	23 rd /Dakota ^a
19 Polk	MCS	5:15 a.m.–12:45 a.m.	15	15	15	25 th /Connecticut ^a
22 Fillmore	TCS	24 hour service	9	10	8	18 th /Connecticut
48 Quintara-24 th St	MCS	6:15 a.m.–11:30 p.m.	10	15	12	25 th /Connecticut ^a
T Third St	LRV-1	4:45 a.m.–12:15 a.m.	10	10	9	23 rd /Third

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.
Muni routes that run on Potrero Avenue and US 101 were not included as part of this analysis as they do not have stops within the vicinity of the Project site.

- a. Due to the size of the Project site, multiple transit stops for these routes are located in the vicinity of the Project site. The nearest stop indicated is the most central transit stop relative to the Project site location.
- b. Weekday time periods: AM (7:00 a.m.–9:00 a.m.), Midday (9:00 a.m.–4:00 p.m.), and PM (4:00 p.m.–6:00 p.m.).
- c. TCS = Trolley Coach Standard; MCS = Motor Coach Standard; LRV = Light Rail Vehicle (1 or 2 cars).

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 somewhere between 30 to 80 percent of seated capacity (depending upon the specific transit vehicle configuration). For example, the capacity of a light rail is 119 passengers, the capacity

of historic streetcar is 70 passengers, and the capacity of a standard bus is 63 passengers. Muni’s standard for capacity utilization is 85 percent.

Capacity utilization is calculated at the maximum load point for the route. The maximum load point for each route is the stop along the route with the highest ridership, regardless of the location of the stop; thus, is not necessarily the nearest or closest stop to the Project site. For example, the inbound 10 Townsend line has its MLP at the Sansome/Filbert stop, located in downtown San Francisco.

The capacity utilization at the maximum load point (MLP) during the weekday PM peak hour for the nearby Muni lines is presented in Table 4.7-5. As shown in Table 4.7-5, the inbound T Third Street Muni line has a load during the weekday PM peak hour at the Embarcadero/Folsom stop that exceeds Muni’s standard of 85 percent capacity utilization. In addition, the 10 Townsend route exceeds the 85 percent utilization standard in both the inbound MLP at Sansome/Filbert and the outbound MLP at Sansome/California. All other study Muni lines operate at a capacity utilization of less than 85 percent.

Route	Direction of Travel	Ridership^c	Capacity Utilization	Maximum Load Point (MLP)
10 Townsend ^a	Inbound	186	98%	Sansome/Filbert
	Outbound	171	90%	Sansome/California
19 Polk ^a	Inbound	172	68%	7 th /Howard
	Outbound	124	49%	Polk/Sutter
22 Fillmore ^b	Inbound	328	58%	16 th /Folsom
	Outbound	327	58%	Fillmore/Hayes
48 Quintara-24 th St ^a	Inbound	175	46%	24 th /Folsom
	Outbound	180	48%	24 th /Mission
T Third St ^b	Inbound	656	92%	Embarcadero/Folsom
	Outbound	554	78%	Van Ness Station

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.

Bold indicates load exceeding Muni’s capacity utilization standard.

a. Data for the 10 Townsend, 19 Polk, and 48 Quintara-24th Street lines include SFMTA APC data from 2011.

b. Data included most recent TEP data (SFMTA Fall 2006—Spring 2007 TEP Monitoring data).

c. Ridership for peak hour of PM peak period; obtained from Muni TEP data. Ridership includes total riders at Maximum Load Point (MLP) of route during the weekday PM peak hour.

Existing Muni Screenline Analysis. Muni service capacity is also defined by a set of screenlines surrounding the greater downtown San Francisco area. Muni screenlines defined in the San Francisco Planning Department’s 2002 Transportation Impact Analysis Guidelines for Environmental Review (SF Guidelines). These screenlines are located near the maximum load points of Muni lines crossing the screenlines. Each screenline contains several transit corridors where the majority of transit travel occurs. Four screenlines (Northeast, Northwest, Southeast, and Southwest)

are roughly located around the peak travel points going to and from the downtown area; and relatively define travel to Superdistrict 1 from Superdistricts 2, 3, and 4 (inbound) in the AM peak, and the reverse in the PM peak. The map showing locations of Muni screenlines is included in Appendix 4.7, *Transportation*. During the existing PM peak hour, the Southeast screenline in the outbound direction operates with a capacity utilization of 66 percent, below Muni’s 85 percent capacity utilization standard (Table 4.7-6).

Table 4.7-6 Muni Screenline Analysis—Existing Weekday PM Peak Hour

<i>Screenline/Corridor</i>	<i>Ridership</i>	<i>Peak Hour Capacity</i>	<i>Capacity Utilization</i>
Southeast Screenline			
Third St Corridor	554	714	78%
Mission St Corridor	1,254	2,350	53%
San Bruno/Bayshore Corridor	1,671	2,256	74%
All Other Lines	1,189	1,708	70%
<i>Total</i>	<i>4,668</i>	<i>7,028</i>	<i>66%</i>

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.

Muni Transit Effectiveness Project (TEP) Recommendations. The Transit Effectiveness Project (TEP) is a review of the Muni public transportation system conducted by the San Francisco Municipal Transportation Agency (SFMTA) in collaboration with the City Controller’s Office to improve reliability, reduce travel times, and provide for improved Muni service based on increasing frequencies and updating bus routes and rail lines to match with changing travel patterns throughout San Francisco, via proposed recommendations for Muni. SFMTA published a TEP Implementation Strategy in April 2011. The TEP Improvement Strategy anticipates that many of the service improvements would be implemented sometime between the end of Fiscal Year (FY) 2013 and FY 2015. The remainder of service improvements would occur in FY 2016. Within the project study area, the following changes were recommended as part of the TEP:

- The one-car K Ingleside would continue to be through-routed with the T Third Street.
- The 10 Townsend would be renamed to become the 10 Sansome. Short-line service would operate between Van Ness Avenue and Market Street to provide additional capacity, replacing the to-be-discontinued 12 Pacific service. Existing service during peak periods within the project study area would be reduced from 10-minute headways to 15-minute headways.
- The 19 Polk would be rerouted to operate between Van Ness Avenue/North Point and San Francisco General Hospital, modifying existing routing in the Civic Center area. Segments south of 24th Street would be replaced by a revised 48 Quintara-24th Street.
- The 22 Fillmore would be rerouted to continue along 16th Street to Third Street, creating new connections to Mission Bay. The segment on 17th Street, Connecticut Street, and 18th Street would be replaced by a revised 33 Stanyan and more frequent peak service would be

provided to reduce crowding (service every six minutes during the weekday PM peak period).

- Service on the 48 Quintara-24th Street would run all day from 48th Avenue to Hunters Point Shipyard, currently served by the 19 Polk, complemented by a new 58 24th Street service connecting Diamond Street with the 22nd Street Caltrain station. Segments along Douglass Street and Hoffman Street would be served by a revised 35 Eureka. Existing segments in Potrero Hill would be supplemented by the new 58 24th Street line, and service along Arkansas Street, 20th Street, and Texas Street would be eliminated.

Regional Transit Providers

BART operates regional rail transit service connecting the East Bay (from Pittsburg/Bay Point, Richmond, Dublin/Pleasanton and Fremont) and San Mateo County with San Francisco. Within San Francisco, BART operates along Market and Mission Streets. The nearest BART station is the 24th Street/Mission Station, located about 1.3 miles west of the Project site.

Caltrain provides rail passenger service on the Peninsula between Gilroy and San Francisco. The San Francisco terminal is located at Fourth and Townsend streets, in the South of Market area. The closest Caltrain station is the 22nd Street Station, located approximately 0.3 mile northeast of the Project site. This station is served by local, limited, and “baby bullet” express train service. Currently, Caltrain operates 88 trains each weekday, with a combination of express and local service.

SamTrans provides bus service between San Mateo County and San Francisco. It operates four bus lines that serve San Francisco, including one express route. In general, SamTrans service to downtown San Francisco operates along Mission Street and Potrero Avenue. The nearest SamTrans terminal is located at the Temporary Transbay Terminal on Howard Street between Main and Beale Streets, approximately 2.5 miles north of the Project site.

AC Transit is the primary bus operator for the East Bay, including Alameda and western Contra Costa Counties. AC Transit operates 27 routes between the East Bay and San Francisco, all of which terminate at the Temporary Transbay Terminal, located 2.5 miles north of the Project site.

Golden Gate Transit (GGT) is operated by the Golden Gate Bridge Highway and Transportation District and provides transit service between the North Bay (Marin and Sonoma counties) and San Francisco. GGT operates 23 commuter bus routes, and five basic bus routes. The closest stops are located on Market Street at Seventh and Eighth Streets, about 2 miles north of the Project site. GGT also operates ferry service between the North Bay and San Francisco. During the morning and evening commute periods, ferries run between Larkspur and San Francisco, and between Sausalito and San Francisco. The San Francisco terminal is located at the Ferry Building, about 2.8 miles north of the Project site.

The existing transit network in the vicinity of the Project site is illustrated in Figure 4.7-3. Regional routes that travel along US 101 and I-280 are shown in the figure, but were omitted from analysis as these lines do not directly serve the project study area.

Existing Regional Transit Screenline Analysis. For the East Bay, the regional transit screenline is defined by the San Francisco Bay and the Bay Bridge. This screenline accommodates AC Transit, BART, and the ferry service from Alameda and Contra Costa Counties. The North Bay screenline is defined by the San Francisco Bay as well as the Golden Gate Bridge. GGT buses and ferries provide service to and from the North Bay. The South Bay screenline is defined by the San Francisco and San Mateo County border. Transit services serving the South Bay include BART, Caltrain, and SamTrans. All regional transit providers have a 100 percent capacity utilization standard.

Table 4.7-7 summarizes capacity utilization for each regional transit screenline during the weekday PM peak hour based on ridership data obtained from the San Francisco Planning Department. During the existing PM peak hour, no regional transit provider exceeds its capacity utilization standard.

Table 4.7-7 Regional Transit Screenline Analysis—Existing Weekday PM Peak Hour				
<i>Region</i>	<i>Regional Transit Operator</i>	<i>Ridership</i>	<i>Peak Hour Capacity</i>	<i>Capacity Utilization</i>
East Bay	BART	20,067	24,150	83%
	AC Transit	2,517	4,193	60%
	Ferries	702	1,519	46%
	<i>Subtotal</i>	<i>23,286</i>	<i>29,862</i>	<i>78%</i>
North Bay	GGT Buses	1,397	2,205	63%
	GGT Ferries	906	1,700	53%
	<i>Subtotal</i>	<i>2,303</i>	<i>3,905</i>	<i>59%</i>
South Bay	BART	10,202	16,800	61%
	Caltrain	1,986	3,250	61%
	SamTrans	575	940	61%
	<i>Subtotal</i>	<i>12,763</i>	<i>20,990</i>	<i>61</i>
<i>Total</i>		<i>38,352</i>	<i>54,757</i>	<i>70%</i>

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.

Pedestrian Facilities

In the study area, sidewalks along most roadways are about 5- to 6-feet wide. Sidewalks are typically provided along both sides of the street, except in areas where topography constrains sidewalk availability to one side of the street, such as along the north side of 23rd Street between Arkansas Street and Dakota Street, as well as along the south side of 25th Street between Connecticut Street and Mississippi Street. On some streets where the main type of off-street parking is

perpendicular, directly adjacent to the street and with wide curb cuts, such as at Dakota Street and Connecticut Street, vehicles must cross the sidewalk to access this perpendicular parking.

About one-half of the crosswalks within the study area are striped and/or marked. At the Connecticut Street/Wisconsin Street, 25th Street/Wisconsin Street, 25th Street/Connecticut Street, 23rd Street/Wisconsin Street, and 23rd Street/Dakota Street intersections, crosswalks are marked for pedestrian crossings. Crosswalks are not marked at the intersections of: Turner Terrace/Missouri Street, 22nd Street/Missouri Street, 23rd Street/Arkansas Street, 25th Street/Dakota Street/Texas Street, 26th Street/Wisconsin Street, and 26th Street/Connecticut Street. In addition, there is one pedestrian stairway along 23rd Street at Wisconsin Street.

In general, under the existing conditions, pedestrian activity within and around the Project site is considered to be low.

Bicycle Facilities

The bicycle route network in the project study area is shown in Figure 4.7-4. Bicycle facilities are typically classified as Class I, Class II, or Class III.

Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists or pedestrians. Class II bikeways are bike lanes striped within the paved areas of roadways and established for preferential use of bicycles. Class III bikeways are signed bike routes that allow bicycles to share the road with vehicles.

There are four primary bicycle routes in the vicinity of the Project site, including the following:

- Route #25 on Potrero Avenue between 20th Street and 25th Street (Class II facility)
- Route #525 on 23rd Street between Potrero Avenue and Kansas Street, and on Kansas Street between 23rd Street and Cesar Chavez Street (Class III facility)
- Route #60 on Cesar Chavez Street between Vermont Street and Third Street (Class III facility)
- Route #7 on Indiana Street between 20th Street and Cesar Chavez Street (Class III facility)

The Route #25 Class II bicycle facility along Potrero Avenue is a continuous, striped, 5-foot-wide bicycle lane in both the northbound and southbound directions; however, at intersections along Potrero Avenue, the exclusive bicycle lanes become a shared-use facility for vehicles and bicyclists approximately 200 feet prior to the intersections. Route #525 is a Class III wide curb lane bicycle route along 23rd Street and Kansas Street, and is a shared-use facility with no specific bicycle lane or “sharrow” treatment (a painted shared-use arrow). Route #60 is a Class III bicycle route along Cesar Chavez Street. It does not include any demarcations signifying a designated bicycle route and is also treated as a shared-use facility. Route #7 is a Class III wide curb lane bicycle route along Indiana Street, and is also a shared-use facility with no specific bicycle lane or sharrow treatment. There are currently no bicycle parking spaces at the Project site.



SOURCE: Potrero HOPE Transportation Study, June 2012.

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FIGURE 4.7-4: EXISTING BICYCLE NETWORK

Current access to the Project site by bicycle is minimal. Portions of 23rd Street, 25th Street, Dakota Street, and Connecticut Street are the flattest and most accessible streets for bicycles at the Project site. Given the topography of the Project site, bicycle activity in its vicinity is low. The aforementioned bicycle routes provide connections to other neighborhoods in San Francisco.

According to the SFMTA, none of the study intersections experienced a significant amount of bicycle collision injuries from 2000 to 2008.³

The San Francisco Bicycle Plan, certified in June 2009 by the San Francisco Planning Department, began implementing projects around the city beginning in summer 2010. As part of this plan, a total of 84 bicycle-related (60 near-term and 24 long-term) projects were proposed for implementation to encourage bicycle ridership and improve bicycle safety throughout the city.⁴ Table 4.7-8 shows the San Francisco Bicycle Plan projects near the Project site.

Project Number^a	Bicycle Project	Bicycle Route Number	Range of Implementation	Description of Project
5-1	23 rd St Bicycle Lanes, Kansas St to Potrero Ave	#525	Near-Term	Conversion of existing wide curb lane bicycle route to sharrows and/or full bicycle lanes in both directions
5-5	Cesar Chavez St Bicycle Lanes, I-280 to US 101 Freeways	#60	Near-Term	Conversion of existing shared-lane bicycle route to sharrows and/or full bicycle lanes in both directions
5-8	Kansas St Bicycle Lanes, 23 rd St to 26 th St	#525	Near-Term	Conversion of existing wide curb lane bicycle route to sharrows and/or full bicycle lanes in both directions

SOURCES: CDM Smith. 2012. *Potrero HOPE Transportation Study*. October. Sacramento, CA.

Near-term improvement project descriptions available: <http://www.sfmta.com/cms/bproj/Bicycle_Plan_Projects_000.htm>.

a. The first number in the project number indicates the cluster number, an assigned number, to determine the closest geographic bicycle projects that would potentially have transportation impacts associated with implementation.

The following improvements to the neighboring bicycle network within the study area have been completed as part of the San Francisco Bicycle Plan:

- Project 5-1—This project converted the existing wide curb lane bicycle route along 23rd Street between Kansas Street and Potrero Avenue to sharrows in both directions
- Project 5-5—This project converted the existing shared-lane bicycle route along Cesar Chavez Street between I-280 and US 101 freeways to full bicycle lanes in both directions
- Project 5-18—This project converted the existing wide curb lane bicycle route along Kansas Street between 23rd and 26th Streets to full bicycle lanes in both directions

³ San Francisco Municipal Transportation Agency. 2009. *2008 San Francisco Collision Report*. December.

⁴ San Francisco Municipal Transportation Agency. 2009. *2009 San Francisco Bicycle Plan*. Available: <<http://www.sfmta.com/projects-planning/projects/2009-san-francisco-bicycle-plan>>. Accessed: February 14, 2014.

- Minor improvements to the existing bicycle route along Indiana Street between Mariposa Street and Cesar Chavez Street

Retail and Freight Loading Conditions

The Project site does not currently have any retail land uses. There are no freight loading operations within the Project site, nor does the Project site have any designated on-or off-street loading spaces.

Parking Facilities⁵

Study Area Parking. The parking study area includes the Project site and the area surrounding the Project site bounded by 20th Street on the north, 26th Street on the south, Caroline Street on the west, and Texas Street on the east (Figure 4.7-5).

The majority of the parking within the study area consists of unmetered, no-time limit on-street parking, with street cleaning restrictions. Due to the nature of the terrain of the study area, many blocks require perpendicular street parking. A small portion of the parking study area (not within the Project site), bounded by 20th Street to the north, Texas Street to the east, 22nd Street to the south, and Connecticut Street to the west, lies within the “X” Residential Parking Permit (RPP) area. Vehicles displaying a RPP within this area are not subject to posted parking time limits. Current restrictions include two-hour time limits for vehicles not displaying a RPP sticker; these restrictions are enforced Monday through Friday, from 8:00 a.m. to 6:00 p.m. All vehicles, including those with RPP stickers, are subject to current street cleaning restrictions.

Field observations indicate that there are approximately 1,301 on-street parking spaces and 64 off-street parking spaces within the study area, not including parking spaces within the Project site itself. On-street parking supply and calculated occupancy rates for the study area are listed in Table 4.7-9.

The study area’s off-street parking occupancy rate was approximately 80 percent during the evening peak period (4:00 p.m. to 6:00 p.m.). Although the off-street parking occupancy rate is high, parking availability within the parking study area is generally sufficient due to the availability of ample on-street parking.

No public off-street parking facility is located within the parking study area. The closest public parking facility in the vicinity of the Project site is the San Francisco General Hospital parking garage, located approximately four blocks west of the Project site at 23rd Street and Utah Street.

⁵ As discussed in more detail in Section 5.7, *Transportation and Circulation*, the Proposed Project is subject to Senate Bill (SB) 743 and Section 21099 to the Public Resources Code, which eliminated the analysis of parking impacts for certain urban infill projects under CEQA. However, since the Proposed Project is also subject to NEPA, parking is still considered in this analysis.



SOURCE: Potrero HOPE Transportation Study, June 2012.

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FIGURE 4.7-5: PARKING STUDY AREA

Project Site Parking. There are approximately 256 off-street and approximately 100 on-street parking spaces within the existing Project site boundaries. Approximate parking occupancy rates for the Project site are listed in Table 4.7-9. These were developed based on general observations, not by actual counts. Overall, parking occupancy within the Project site was observed to be less than 50 percent for both on- and off-street facilities during the weekday PM peak period (4:00 p.m. to 6:00 p.m.).

Table 4.7-9 Existing Study Area On-Street Parking Supply and Occupancy—Weekday PM Peak Period

<i>Block Face</i>	<i>Street</i>	<i>Location</i>		<i>Parking Supply</i>		<i>Parking Occupancy</i>	
		<i>From</i>	<i>To</i>	<i>On-Street</i>	<i>Off-Street</i>	<i>On-Street</i>	<i>Off-Street</i>
N	20 th St	Carolina St	Wisconsin St	8	0	25%	—
N	20 th St	Wisconsin St	Arkansas St	10	0	30%	—
N	20 th St	Arkansas St	Connecticut St	10	0	80%	—
N	20 th St	Connecticut St	Missouri St	10	0	70%	—
N	20 th St	Missouri St	Texas St	14	0	29%	—
N	22 nd St	Carolina St	Wisconsin St	8	0	38%	—
N	22 nd St	East of Wisconsin St		0	0	0	—
N	23 rd St	Carolina St	Wisconsin St	5	0	60%	—
N	Sierra St	Missouri St	Texas St	10	0	30%	—
N	25 th St	Connecticut St	Texas St	1	12	100%	92%
N	26 th St	Wisconsin St	Connecticut St	16	20	69%	90%
N	Coral Rd	Carolina St	Wisconsin St	12	0	25%	—
N	Caire Ter	—		0	5	—	60%
E	Carolina St	Caire Ter	Coral Rd	0	0	—	—
E	Carolina St	Coral Rd	Coral Rd	12	0	92%	—
E	Carolina St	Coral Rd	23 rd St	7	0	43%	—
E	Carolina St	23 rd St	22 nd St	25	0	68%	—
E	Carolina St	22 nd St	20 th St	60	0	50%	—
E	Wisconsin St	26 th St	Blaire Ter	3	0	33%	—
E	Wisconsin St	Blaire Ter	25 th St	18	0	39%	—
E	Wisconsin St	25 th St	Coral Rd	6	0	0%	—
E	Wisconsin St	Coral Rd	Carolina St	48	0	33%	—
E	Wisconsin St	Carolina St	23 rd St	12	0	67%	—
E	Wisconsin St	23 rd St	Madera St	12	0	33%	—
E	Wisconsin St	Madera St	22 nd St	18	0	67%	—
E	Wisconsin St	22 nd St	20 th St	32	0	47%	—
E	Arkansas St	22 nd St	20 th St	70	0	43%	—
E	Connecticut St	26 th St	25 th St	20	0	20%	—
E	Connecticut St	22 nd St	20 th St	75	0	57%	—
E	Missouri St	Turner Ter	Sierra St	14	0	21%	—

Table 4.7-9 Existing Study Area On-Street Parking Supply and Occupancy—Weekday PM Peak Period

Block Face	Street	Location		Parking Supply		Parking Occupancy	
		From	To	On-Street	Off-Street	On-Street	Off-Street
E	Missouri St	Sierra St	20 th St	40	0	63%	—
E	Texas St	Sierra St	20 th St	80	0	45%	—
S	20 th St	Carolina St	Wisconsin St	10	0	20%	—
S	20 th St	Wisconsin St	Arkansas St	10	0	60%	—
S	20 th St	Arkansas St	Connecticut St	10	0	90%	—
S	20 th St	Connecticut St	Missouri St	10	0	70%	—
S	20 th St	Missouri St	Texas St	10	0	30%	—
S	22 nd St	Carolina St	Wisconsin St	10	0	30%	—
S	22 nd St	East of Wisconsin St		0	0	0	—
S	23 rd St	Carolina St	Wisconsin St	5	7	20%	100%
S	Sierra St	Missouri St	Texas St	10	0	70%	—
S	25 th St	Connecticut St	Texas St	5	0	60%	—
S	26 th St	Wisconsin St	Connecticut St	30	0	23%	—
S	Coral Rd	Carolina St	Wisconsin St	12	0	0%	—
S	Caire Ter	—		0	12	—	58%
W	Carolina St	Caire Ter	Coral Rd	17	0	12%	—
W	Carolina St	Coral Rd	Coral Rd	12	0	83%	—
W	Carolina St	Coral Rd	23 rd St	0	6	—	100%
W	Carolina St	23 rd St	22 nd St	36	0	53%	—
W	Carolina St	22 nd St	20 th St	60	0	65%	—
W	Wisconsin St	26 th St	Blaire Ter	2	0	100%	—
W	Wisconsin St	Blaire Ter	25 th St	10	0	0%	—
W	Wisconsin St	25 th St	Coral Rd	4	0	0%	—
W	Wisconsin St	Coral Rd	Carolina St	10	0	80%	—
W	Wisconsin St	Carolina St	23 rd St	12	0	58%	—
W	Wisconsin St	23 rd St	Madera St	25	0	48%	—
W	Wisconsin St	Madera St	22 nd St	48	0	50%	—
W	Wisconsin St	22 nd St	20 th St	62	0	85%	—
W	Arkansas St	22 nd St	20 th St	32	0	53%	—
W	Connecticut St	26 th St	25 th St	37	0	65%	—
W	Connecticut St	22 nd St	20 th St	75	0	60%	—
W	Missouri St	Turner Ter	Sierra St	1	2	0%	0%
W	Missouri St	Sierra St	20 th St	20	0	50%	—
W	Texas St	Sierra St	20 th St	60	0	23%	—
<i>Total</i>				1,301	64	50%	81%

SOURCE: CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Sacramento, CA.

Emergency Vehicle Access

The closest fire station in the vicinity of the Project site is Fire Station #37, located northwest of the Project site at 798 Wisconsin Street, at the intersection with 22nd Street. The closest police station is the Mission Police Station, located to the northwest of the Project site at 630 Valencia Street, at the intersection with 17th Street.

The existing roadway layout allows for minimal cross-site connections for emergency vehicles and includes two cul-de-sacs within the Potrero Annex site. The Potrero Annex site can only be accessed using Missouri Street via 23rd Street and Dakota Street from the south. The southern portion of the Potrero Annex is accessible using Texas Street, which near the Project site is a narrow path that is barely wide enough for one car.

4.8 NOISE

4.8.1 Introduction

This section of the Draft EIR/EIS discusses the existing conditions with respect to the existing ambient noise environment at and in the vicinity of the Proposed Project site. Data for this section of the Draft EIR/EIS was obtained through the California Department of Transportation, the Federal Railroad Administration, the transportation impact study (TIS) prepared for the Proposed Project,¹ and other available sources of technical information. The technical data associated with this section is provided in Appendix 4.8.

Several comments were submitted during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods. Specifically, concerns were raised regarding construction noise, an increase in traffic noise, and an increase of human activity that could result in higher noise levels. These and other issues are addressed in Section 5.8, *Noise*. Section 5.8 includes a complete analysis of the potential environmental effects of the Proposed Project with regard to noise.

4.8.2 Environmental Setting

■ Acoustic Terminology and Definitions

Sound is created when vibrating objects produce pressure variations that move rapidly outward into the surrounding air. The main characteristics of these air pressure waves are amplitude, which we experience as a sound's loudness, and frequency, which humans experience as a sound's pitch.² The standard unit of sound amplitude is the decibel (dB). The decibel is a measure of the physical magnitude of the pressure variations relative to the human threshold of perception. The human ear's sensitivity to sound amplitude is frequency-dependent; it is more sensitive to sounds in the mid-frequency range than to sounds with much lower or higher frequencies.

Most "real world" sounds (e.g., a dog barking, a car passing, etc.) are complex mixtures of many different frequency components, each having different amplitudes. When the average amplitude of such sounds is measured with a sound level meter, it is common for the instrument to apply adjustment factors to each of the measured sound's frequency components. These factors account for the differences in perceived loudness of each of the sound's frequency components relative to those to which the human ear is most sensitive. Because the human ear is not equally sensitive to a

¹ CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Prepared for City and County of San Francisco Planning Department, Case No. 2010.0515E.

² Technically, amplitude is defined as a wave's height at its crest, while frequency is the number of waves in a given period of time and is a function of wave length. The greater the amplitude, the louder a sound appears and the greater the frequency, the "higher" the sound appears.

given sound level at all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The unit of A-weighted sound amplitude is also the decibel. In reporting measurements to which A-weighting has been applied, an “A” is appended to dB (dBA) to make this clear. In some cases, however, it is useful to know the actual average sound amplitude without application of the A-weighting factors; this type of averaging is called C-weighting and its result is reported in C-weighted decibels (dBC). Finally, since environmental sound levels usually vary greatly over time, it is often useful to know the degree of variability at a particular location over any measurement period. This variability is specified in terms of statistical sound levels (L_n), where n is the percentage of time these levels are exceeded during the measurement period. For example, L_{10} , L_{50} , and L_{90} are descriptors that represent the sound level exceeded 10 percent of the time, 50 percent of the time, and 90 percent of the time, respectively, during a measurement, while L_{min} and L_{max} represent the minimum and maximum sound levels during the measurement period.

Noise is the term generally given to the intrusive, “unwanted” aspects of sound. Many factors influence how a sound is perceived and whether it is considered harmful or disruptive to an individual or a community. These factors include the primary physical characteristics of a sound (e.g., amplitude, frequency, duration, etc.), but also secondary acoustic and non-acoustic factors that can influence judgment regarding the degree to which it is intrusive and disruptive. Table 4.8-1 lists representative noise levels for the environment.

The General Plan has defined noise-sensitive uses as land uses and/or receptors that include residences of all types, schools, libraries, hospitals, convalescent facilities, rest homes, hotels, motels, and places of worship. Sensitive uses from a noise perspective include places where there is a reasonable expectation that individuals could be sleeping, learning, worshipping, or recuperating. All quantitative descriptors used to measure environmental noise exposure recognize the strong correlation between the high acoustical energy content of a sound (i.e., its loudness and duration) and the disruptive effect it is likely to have as noise. Because environmental noise fluctuates over time, most such descriptors average the sound level over the time of exposure, and some add “penalties” during the times of day when intrusive sounds would be more disruptive to listeners. The rating scales of L_{eq} , L_{min} , L_{max} , L_{dn} , and Community Noise Equivalent Level (CNEL) are all measures of ambient noise, as described in detail below. L_{eq} is the average A-weighted sound level measured over a given time interval. L_{eq} can be measured over any time period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods. L_{dn} is another average A-weighted sound level measured over a 24-hour time period. However, this noise scale is adjusted to account for some individuals’ increased sensitivity to noise levels during the evening and nighttime hours. L_{eq} , L_{min} , and L_{max} , as well as L_{dn} and CNEL are all applicable to this analysis.

Table 4.8-1 Representative Environmental Noise Levels		
<i>Common Outdoor Activities</i>	<i>Noise Level (dBA)</i>	<i>Common Indoor Activities</i>
	—110—	Rock Band
Jet Fly-over at 100 feet	—105—	
	—100—	
Gas Lawnmower at 3 feet	—95—	
	—90—	
	—85—	Food Blender at 3 feet
Diesel Truck going 50 mph at 50 feet	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime	—75—	
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Commercial Area	—65—	Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	
	—55—	Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
	—45—	
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime	—35—	
	—30—	Library
Quiet Rural Area during Nighttime	—25—	Bedroom at Night, Concert Hall (background)
	—20—	
	—15—	Broadcast/Recording Studio
	—10—	
	—5—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

SOURCE: California Department of Transportation, *Technical Noise Supplement* (2009).

The most commonly used noise descriptors for environmental exposures are:

- **L_{eq}**, the equivalent-energy noise level, is the average acoustic energy³ content of noise over any chosen exposure time. The L_{eq} is the constant noise level that would deliver the same acoustic energy to the ear as the actual time-varying noise over the same exposure time. L_{eq} does not depend on the time of day during which the noise occurs. L_{dn}, the day-night

³ Averaging sound levels in decibels is not done by standard arithmetic averaging, but according to the following rule: $L_{eq} = 10 \times \log((1/n) \times (10^{L_1/10} + 10^{L_2/10} + \dots + 10^{L_n/10}))$; where L₁, L₂, L_n are n individual sound levels. For example, the L_{eq} of the sound levels L₁ = 60 dBA and L₂ = 70 dBA is 67.4 dBA, not 65 dBA as it would if standard arithmetic averaging were used. The larger individual sound levels contribute much more substantially to the L_{eq} than they would to an average done in the standard way.

average noise level, is a 24-hour average L_{eq} with a 10 dBA “penalty” added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for increased nighttime noise sensitivity. Because of this penalty, the L_{dn} would always be higher than its corresponding 24-hour L_{eq} (e.g., a constant 60 dBA noise over 24 hours would have a 60 dB L_{eq} , but a 66.4 dBA L_{dn}).

- L_{min} , minimum noise level, is the lowest A/B/C weighted integrated noise level during a specific period of time.
- L_{max} , maximum noise level, is the highest A/B/C weighted integrated noise level occurring during a specific period of time.
- **CNEL**, the community noise equivalent level, is a 24-hour average L_{eq} with a 5 dBA “weighting” during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA “weighting” added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
- **SEL**, the sound exposure level (also known as the single noise event level), is the constant noise level that would deliver the same acoustic energy to the ear of a listener during a one-second exposure as the actual time-varying noise would deliver over its entire time of occurrence.⁴ SEL is typically used to characterize the effects of short-duration noise events (e.g., aircraft fly-overs or train pass-bys).

Noise levels from a particular source decline as distance to the receptor increases. Other factors, such as the weather and other reflecting or shielding factors, also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically “hard” locations (i.e., where the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically “soft” locations (i.e., where the area between the source and receptor is unpacked earth or has vegetation, including grass). Noise from stationary or point sources (such as commercial heating and ventilation units [HVAC] or construction equipment) is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Generally, if a noise source is completely enclosed or completely shielded with a solid barrier located close to the source, an 8 dBA noise reduction can be expected; if the enclosure and/or barrier are interrupted, noise would be reduced by only 5 dBA. The exterior-to-interior reduction of newer residential units and office buildings is generally 25 dBA or more with windows and doors closed and 15 dBA with windows and doors open.

⁴ For a sound lasting longer than one second, its SEL would be higher than that of the largest of the shorter-duration component sounds that make up the total. For example, if a sound with a ten-second-long duration made up of 10 one-second-long component sounds, each of 60 dBA amplitude, its SEL would be 70 dBA.

■ **Fundamentals of Environmental Groundborne Vibration**

Vibrating objects in contact with the ground radiate energy through the ground. If the object is massive enough and/or close enough to an observer, the ground vibrations are perceptible. Groundborne vibration is measured by its peak particle velocity (PPV). The PPV is normally described in inches per second. PPV is appropriate for determining potential structure damage, but it does not evaluate human response to vibration. The ground motion caused by vibration is given in decibel notation, referenced as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration relative to human response.⁵ Vibration magnitude is measured in vibration decibels relative to a 1 micro-inch-per-second reference level. Background vibration levels in most inhabited areas are usually 50 VdB or lower, well below the threshold of perception (i.e., typically about 65 VdB). In most cases, when vibration is perceptible to people in their homes or workplaces, the source is within the same building (i.e., operation of HVAC equipment, movement of other occupants, slamming of doors, etc.). The outdoor sources most commonly responsible for producing perceptible vibration are heavy construction equipment, steel-wheeled trains, and motor vehicle traffic on rough roads (if the roadway is smooth, the vibration from traffic is rarely perceptible).

Vibration at high enough levels can result in human annoyance. Groundborne vibration can also potentially damage the foundations and exteriors of fragile structures if they are close enough to the vibration source. The FTA damage thresholds indicate that, for buildings not extremely sensitive to vibration, a damage threshold of between 0.2 in/sec to 0.5 in/sec PPV would apply depending on the type of building. However, damage potential is typically limited to vibration generated by impact equipment, such as pile drivers.

■ **Health Effects of Environmental Noise**

The World Health Organization (WHO) is perhaps the best source of current knowledge regarding health impacts due to the fact that the European nations have continued to study noise and its health effects, while the U.S. Environmental Protection Agency (USEPA) all but eliminated its noise investigation and control program in the 1970s.⁶ According to WHO, sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA or when intermittent interior noise levels reach 45 dBA, 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 or below, and short-term events should not generate noise

⁵ Federal Railroad Administration. 2005. *High Speed Ground Transportation Noise and Vibration Impact Assessment*. October. Washington, DC.

⁶ The *San Francisco General Plan Land Use Compatibility Guidelines for Community Noise* were created during the same era.

in excess of 60 dBA. 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, although shorter-term exposure to very high noise levels, for example, exposure several times a year to concert noise at 100 dBA, can cause hearing impairment). 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 with noise levels below 50 dBA. The City and County of San Francisco has incorporated WHO findings into the San Francisco Noise Ordinance.

■ Existing Noise Environment

The Project site is located on the southern slope of Potrero Hill, which includes residential and industrial uses. Noise sources within the Project vicinity are primarily automobiles and buses. East and south of the Project site, major transportation corridors include Interstate 280 (I-280) and Cesar Chavez Street. Noise from outdoor activities (e.g., people talking) and commercial aircraft overflights contribute to the existing noise environment to a lesser extent.

In 2008, the San Francisco Department of Public Health produced a comprehensive map showing the transportation noise levels on every street throughout the city, as well as the areas subject to noise levels over 60 dBA (L_{dn}).⁸ This map was created using a digital local traffic-based model, which was based on the Federal Highway Administration (FHWA) Traffic Noise Model. The map is used as a screening tool to determine whether further acoustical studies are required.

In order to more precisely characterize the existing noise environment in the plan area, long- and short-term noise measurements were taken at five locations. One long-term (24-hour) measurement was taken at the corner of Missouri Street and Turner Terrace and was measured to be 58.7 dBA L_{eq} for the 24-hour period with a calculated day/night noise level of 62.7 dBA L_{dn} , and a maximum

⁷ World Health Organization. 1999. *Guidelines for Community Noise*. Geneva. Available: <<http://www.who.int/docstore/peh/noise/guidelines2.html>>. Accessed: February 28, 2014.

⁸ San Francisco Department of Public Health. 2008. *Transportation Noise Map 2008*. Available: <<http://www.sfdph.org/dph/files/EHSdocs/ehsPublSdocs/Noise/TransitNoiseMap.pdf>>. Accessed: February 28, 2014.

hourly average noise level of 61.4 dBA L_{eq} occurring between 8:00 a.m. and 9:00 a.m.⁹ Maximum noise levels were likely caused by individual loud vehicles, including diesel trucks and automobiles with modified muffler systems or amplified music) on nearby roadways. Noise levels for the long- and short-term measurements are shown in Table 4.8-2, and the locations of these measurements are shown in Figure 4.8-1.

Noise Receptor	Land Use Description	Noise Level (dBA)			Primary Noise Source
		L_{eq}	L_{min}	L_{max}	
L-1	Residential uses west of I-280 on Missouri St at Turner Ter	58.7	42.9	89.9	Traffic on I-280
S-1	Dakota at 23 rd St, south of Potrero Hill Recreation Center	61.8	54.2	78.5	Traffic on 23 rd St
S-2	Residential uses along Dakota St between 23 rd St and 25 th St	64.6	54.3	79.7	Traffic along Dakota St
S-3	Residential and industrial uses on 26 th St at Connecticut St	62.4	54.1	74.7	Traffic along Connecticut St
S-4	Residential and institutional uses on Wisconsin St at Connecticut St/Coral Rd	60.5	50.0	77.7	Traffic along Wisconsin St

SOURCE: Atkins (2011) (see Appendix 4.8).

Long-term noise measurement was taken from 4:00 p.m. on Tuesday June 7, 2011, to 4:00 p.m. on June 8, 2011. Short-term noise measurements were taken on June 7, 2011, between the hours of 3:30 p.m. and 5:30 p.m. for 15 minutes each.

Short-term traffic noise measurements (i.e., 15 minutes each) were also taken within the Project area at four near-curbside locations during the weekday PM peak commute period, as shown in Figure 4.8-1.¹⁰ Short-term noise measurement locations were selected to characterize the range of daytime noise levels across the Project site.

To evaluate the compatibility of a site under U.S. Department of Housing and Urban Development (HUD) criteria, sound levels can be measured using sound meters, or sound levels can be calculated using HUD's Noise Assessment Guidelines.¹¹

Noise-Sensitive Receptors

Existing noise-sensitive uses on and around the Project site include residential uses throughout the Potrero Hill neighborhood, including along 23rd Street, 25th Street, and Wisconsin Street. The nearest school to the Project site is Starr King Elementary School along Wisconsin Street, directly adjacent to the Project site. The Potrero Hill Recreation Center is located directly north of the Project site on 23rd Street at Arkansas Street.

⁹ Long-term noise measurement was taken by Atkins using a Larson Davis Model 720 digital sound level meter from 4:00 p.m. on June 7, 2011, to 4:00 p.m. on June 8, 2011.

¹⁰ Short-term noise measurements were taken by Atkins using a Larson-Davis Model 820 sound level meter on June 7, 2011, between the hours of 3:30 p.m. and 5:30 p.m. for 15 minutes each.

¹¹ Department of Housing and Urban Development, Environmental Planning Division, Office of Environment and Energy. 1991. *The Noise Guidebook*. September. Washington, DC.



SOURCE: Atkins, 2011.

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FIGURE 4.8-1: NOISE MONITORING LOCATIONS

Existing Traffic Noise

Existing vehicle traffic noise levels in the Project area were modeled using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic data included in the Transportation Study for the Proposed Project.¹² The FHWA model is based on the California Vehicle Noise Reference Energy Mean Emission Levels (CALVENO) factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receptor, and ground attenuation factors.

Table 4.8-3 summarizes the modeled traffic noise levels at 50 feet from the centerline of roadways in the Project area and includes distances from the roadway centerlines to the 55 dBA and 60 dBA L_{dn} traffic noise contours. These traffic noise modeling results are based on existing average daily traffic (ADT) volumes calculated from peak hour traffic turning movements provided in the Transportation Study. As shown in Table 4.8-3, the location of the 60 dBA L_{dn} contour ranges from 0 to 106 feet from the centerline of the modeled roadways. The extent to which existing land uses in the Project area are affected by existing traffic noise depends on their respective proximity to the roadways.

As shown in Table 4.8-3 traffic noise levels due to roadways adjacent to and within the Project site would not exceed 65 dBA L_{dn} . The existing traffic noise levels shown in Table 4.8-3 would not exceed HUD's 65 dBA L_{dn} exterior noise standard and would be classified as acceptable. I-280 is located approximately 835 feet east of the Project site. Because this roadway is within 1,000 feet, the potential contribution to noise at the Project site was assessed using HUD's Noise Assessment Guidelines.¹³ The noise level from I-280 traffic, not accounting for shielding by intervening buildings and topography, was estimated at 63 dBA L_{dn} , or 60 dBA L_{dn} when accounting for intervening buildings and topography.

¹² CDM Smith. 2012. *Potrero HOPE Transportation Study*, Final Report. June. This report is available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2010.0515E.

¹³ Department of Housing and Urban Development, Environmental Planning Division, Office of Environment and Energy. 1991. *The Noise Guidebook*. September. Washington, DC.

Table 4.8-3 Existing Modeled Traffic Noise Levels along Local Roadways							
Roadway	Roadway Segment		<i>L_{dn}</i> (dBA) at 100 feet	Distance (feet) from Roadway Centerline to <i>L_{dn}</i> Contour			
	From	To		70 dBA	65 dBA	60 dBA	55 dBA
Cesar Chavez St	York St	Vermont St	63	11	33	106	335
Cesar Chavez St	Vermont St	Connecticut St	63	10	31	99	313
Cesar Chavez St	Connecticut St	Pennsylvania Ave	63	10	30	96	303
Cesar Chavez St	Pennsylvania Ave	Tennessee St	62	9	28	87	275
25 th St	Wisconsin St	Connecticut St	51	1	2	7	22
25 th St	Connecticut St	Dakota St	53	1	4	11	35
25 th St	Dakota St	Indiana St	53	1	3	11	34
25 th St	Indiana St	3 rd St	56	2	6	19	61
23 rd St	Folsom St	Potrero Ave	51	1	2	6	18
23 rd St	Potrero Ave	SR-101	56	2	6	20	65
23 rd St	Wisconsin St	Dakota St	49	0	1	4	14
23 rd St	Dakota St	Missouri St	48	0	1	3	9
20 th St	Rhode Island St	Arkansas St	54	1	4	12	38
20 th St	Arkansas St	Missouri St	54	1	4	13	41
Potrero Ave	21 st St	23 rd St	63	9	28	90	283
Potrero Ave	23 rd St	25 th St	62	8	27	85	268
Wisconsin St	20 th St	23 rd St	51	1	2	6	20
Wisconsin St	23 rd St	26 th St	51	1	2	7	22
Arkansas St	18 th St	20 th St	48	0	1	3	11
Arkansas St	20 th St	23 rd St	48	0	1	3	10
Connecticut St	Cesar Chavez St	25 th St	53	1	3	11	33
Connecticut St	25 th St	23 rd St	48	0	1	3	11
Dakota St	25 th St	23 rd St	51	1	2	6	20
Texas St	25 th St	22 nd St	34	0	0	0	0
Missouri St	20 th St	22 nd St	47	0	1	2	8
Missouri St	22 nd St	23 rd St	47	0	1	2	8
Pennsylvania St	Cesar Chavez St	25 th St	61	6	18	58	183
Pennsylvania St	25 th St	22 nd St	57	2	8	24	75
Indiana St	23 rd St	25 th St	56	2	7	21	68
Indiana St	25 th St	Cesar Chavez St	55	1	5	15	46

SOURCE: Modeled by Atkins (2012) (see Appendix 4.8).

Existing Rail Noise

Caltrain is approximately 575 feet west of the Project site; however, the train enters a tunnel just south and east of the site and is shielded by light industrial buildings and topographic features prior to entering the tunnel. Because this railway is within 3,000 feet, the potential contribution to noise at the Project site was assessed using HUD's Noise Assessment Guidelines.¹⁴ Noise from these sources was calculated using the model defaults and train volumes of 90 diesel trains per day.¹⁵ The noise level from diesel trains, not accounting for shielding by intervening buildings and topography or entering the tunnel, was estimated at 62 dBA L_{dn} , which is classified as acceptable. Taking into account intervening structures and topography as well as the trains entering the tunnel, a conservative 10 dBA reduction was assumed, resulting in a noise level of approximately 52 dBA L_{dn} .

Existing Airport Noise

San Francisco International Airport is approximately 8.5 miles south and Oakland International Airport is approximately 9.5 miles east of the Project site. The Project site is located well outside the 55 dBA CNEL noise contour of both airports.¹⁶

Combined

In order to calculate existing sound levels using HUD's Noise Assessment Guidelines, the following existing noise sources are considered: airports within 15 miles, railroads within 3,000 feet, and arterial roadways within 1,000 feet of the Project site. As the noise levels in the area are considered to be made up of multiple sources, the combination of calculated traffic (62 dBA L_{dn}), aircraft (50 dBA L_{dn}), and rail (59 dBA L_{dn}) noise sources were calculated for the Project site. Based on this calculation (see Appendix 4.8), the existing combined ambient noise level at the Project site is approximately 64 dBA L_{dn} .¹⁷

Existing Groundborne Vibration

Typical sources of groundborne vibration in the Project area are heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks, and transit buses) on local roadways such as Wisconsin Street, 25th

¹⁴ Department of Housing and Urban Development. 1991. *The Noise Guidebook*. September. Washington, DC.

¹⁵ Caltrain. 2012. *Schedules*. Available: <<http://www.caltrain.com/Assets/Stats+and+Reports/Ridership/2012+Annual+Ridership+Counts.pdf>, and <http://511.org/>>. Accessed: June 20, 2012; MUNI (San Francisco Metropolitan Transportation Agency). 2012. *Schedules: Route KT Ingleside/Third Street*. Available: <<http://transit.511.org/accessible/schedules>>. Accessed June 20, 2012).

¹⁶ City/County Association of Governments of San Mateo County Redwood City. 2012. *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport*. Final Draft. May. Prepared by Ricondo & Associates, Inc. Chicago, IL.

¹⁷ Department of Housing and Urban Development. 2012. *Day/Night Noise Level Electronic Assessment Tool*. Available: <<http://www.hud.gov/offices/cpd/environment/dnlcalculatortool.cfm>>. Accessed: December 11, 2012.

Street, and Connecticut Street. Trucks and buses typically generate groundborne vibration velocity levels of around 63 VdB, and these levels could reach 72 VdB where trucks and buses pass over bumps in the road.¹⁸

¹⁸ CDM Smith. 2012. *Potrero HOPE Transportation Study*. Final Report. October. Prepared for City and County of San Francisco Planning Department, Case No. 2010.0515E.

4.9 AIR QUALITY

4.9.1 Introduction

This section of the Draft EIR/EIS discusses the existing air quality conditions in the area for the Proposed Project for both criteria and non-criteria air pollutants. Data for this section of the Draft EIR/EIS were obtained through the Bay Area Air Quality Management District (BAAQMD), U.S. Environmental Protection Agency (USEPA), and the California Air Resources Board (ARB).

Several comments were submitted during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods. Specifically, concerns were raised regarding air quality associated with adjacency to Interstate 280 (I-280) and U.S. Highway 101 (US 101), and air quality impacts from increased vehicular traffic. These and other issues are addressed in Section 5.9, *Air Quality*.

4.9.2 Environmental Setting

■ Climate and Meteorology

The Project area is located within the San Francisco Bay Area Air Basin (SFBAAB). 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 the onshore breezes stimulated by the Pacific Ocean and the Golden Gate to the west provide for generally very good air quality in the Project area.

Temperatures in the vicinity of the Project site average in the mid-50s annually, generally ranging from the low 40s on winter mornings to mid-70s during summer afternoons. Daily and seasonal oscillations of temperature are small because of the moderating effects of the 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 site lies within the San Francisco 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 collected on the San Francisco mainland indicate a prevailing wind direction from the west and an average annual wind speed of

10.7 miles per hour.¹ Increased temperatures create conditions that support increased ozone formation.

■ **Criteria Air Pollutants**

As required by the 1970 federal Clean Air Act, USEPA 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. USEPA calls these pollutants “criteria air pollutants” because the agency has regulated them by developing specific public-health and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead are the six criteria air pollutants originally identified by USEPA. Since that time, subsets of particulate matter have been identified for which permissible levels have been established. These include particulate matter of 10 microns in diameter or less (PM₁₀) and particulate matter 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 4.9-1 presents a 5-year summary for the period between 2009 and 2013 of the highest annual criteria air pollutant concentrations, collected at the air quality monitoring station operated and maintained by BAAQMD at 16th and Arkansas Streets, in San Francisco’s lower Potrero Hill area. The 16th and Arkansas Streets station is the closest monitoring station to the Project site, located about 0.6 to 1.0 miles north of the Project site. Table 4.9-1 also compares measured pollutant concentrations with the most stringent applicable ambient air quality standards (state or federal). Concentrations shown in bold indicate an exceedance of the standard.

Table 4.9-1 Summary of San Francisco Air Quality Monitoring Data Measured at 16th and Arkansas Streets Station (2009–2013)

<i>Pollutant</i>	<i>Most Stringent Applicable Standard</i>	<i>Number of Days Standards Were Exceeded and Maximum Concentrations Measured^a</i>				
		<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
Ozone						
- Days 1-Hour Standard Exceeded		0	0	0	0	0
- Maximum 1-Hour Concentration (pphm)	>9 pphm ^b	7	8	7	7	7
- Days 8-Hour Standard Exceeded		0	0	0	0	0
- Maximum 8-Hour Concentration (pphm)	>7 pphm ^c	6	5	5	5	6

¹ Western Regional Climate Center. 2013. *Prevailing Wind Direction for California 1992–2002*. Available: <<http://www.wrcc.dri.edu/htmlfiles/westwinddir.html#CALIFORNIA>>. Accessed: December 3, 2013.

Table 4.9-1 Summary of San Francisco Air Quality Monitoring Data Measured at 16th and Arkansas Streets Station (2009–2013)

Pollutant	Most Stringent Applicable Standard	Number of Days Standards Were Exceeded and Maximum Concentrations Measured ^a				
		2009	2010	2011	2012	2013
Carbon Monoxide (CO)						
- Days 1-Hour Standard Exceeded		0	0	0	0	0
- Maximum 1-Hour Concentration (ppm)	>20 ppm ^b	4.3	1.8	1.8	2.0	1.8
- Days 8-Hour Standard Exceeded		0	0	0	0	0
- Maximum 8-Hour Concentration (ppm)	>9 ppm ^b	2.9	1.4	1.2	1.2	ND
Suspended Particulates (PM10)						
- Days 24-Hour Standard Exceeded ^d		0	0	0	1	0
- Maximum 24-Hour Concentration (µg/m ³)	>50 µg/m ³ ^b	36	40	46	51	44
Suspended Particulates (PM2.5)						
- Days 24-Hour Standard Exceeded		1	3	2	1	2
- Maximum 24-Hour Concentration (µg/m ³)	>35 µg/m ³ ^c	36	45	48	36	49
- Annual Average (µg/m ³)	>12 µg/m ³ ^{b,c,e}	9.6	10.5	9.5	8.2	10.1
Nitrogen Dioxide (NO ₂)						
- Days 1-Hour Standard Exceeded		0	0	0	1	0
- Maximum 1-Hour Concentration (pphm)	>10 pphm ^c	6	9	9	12	7
Sulfur Dioxide (SO ₂) ^f						
- Days 24-Hour Standard Exceeded		ND	ND	ND	ND	ND
- Maximum 24-Hour Concentration (ppb)	>40 ppb ^b	ND	ND	ND	ND	ND

NOTES:

Bold values are in excess of applicable standard. "ND" indicates that data is not available.

ppm = parts per million; pphm = parts per hundred million; ppb=parts per billion

µg/m³ = micrograms per cubic meter

ND = No data or insufficient data.

a Number of days exceeded is for all days in a given year, except for particulate matter. PM10 and PM2.5 are monitored every six days and therefore the number of days exceeded is out of approximately 60 annual samples.

b State standard, not to be exceeded.

c Federal standard, not to be exceeded.

d Based on a sampling schedule of one out of every six days, for a total of approximately 60 samples per year.

e On December 14, 2012, USEPA lowered the federal primary PM2.5 annual standard from 15.0 to 12.0 µg/m³ and future monitoring will be evaluated based on this standard.

f Sulfur dioxide monitoring was terminated in 2009.

SOURCE: California Air Resources Board. 2014. *iADAM: Air Quality Data Statistics Top 4 Summary*. Available: <http://www.arb.ca.gov/adam/topfour/topfour1.php>>. Accessed: August 1, 2014.

U.S. Environmental Protection Agency. 2013. *Monitor Values Report*. Available: http://www.epa.gov/airdata/ad_rep_mon.html>. Accessed: August 1, 2014.

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 VOC by some regulating agencies) and nitrogen oxides (NO_x). The main sources of ROG and NO_x, 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. Table 4.9-1 shows that, according to published data, the most stringent applicable standards (state 1-hour standard of 9 parts per hundred million [pphm] and the federal 8-hour standard of 8 pphm) were not exceeded in San Francisco between 2009 and 2013.

Carbon Monoxide (CO)

CO is an odorless, colorless gas usually formed as a 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 4.9-1, the more stringent state CO standards were not exceeded between 2009 and 2013. Measurements of CO indicate hourly maximums ranging between 9 to 29 percent of the more stringent state standard, and maximum 8-hour CO levels that are approximately 13 to 32 percent of the allowable 8-hour standard.

Particulate Matter (PM₁₀ and PM_{2.5})

Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from man-made and natural sources. There are ambient air quality standards for two size ranges of particulate matter: PM₁₀ for particles less than 10 microns in diameter, and PM_{2.5} for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about one half of the air basin'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 ARB, 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." ARB also reports that

statewide attainment of particulate matter 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.² 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. High levels of particulate matter can exacerbate chronic respiratory ailments, such as bronchitis and asthma, and have been associated with increased emergency room visits and hospital admissions.³

PM_{2.5} is of particular concern because it bypasses the body's natural filtration system more easily than larger particles and can lodge deep in the lungs, resulting in increased asthma symptoms, respiratory infections and decreased pulmonary function and lung development in children.

Table 4.9-1 shows that a violation of the state PM₁₀ standard occurred on one monitored occasion over the past 5 years in San Francisco. It is estimated that the state 24-hour PM₁₀ standard of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) was exceeded on up to 6 days per year between 2009 and 2013.⁴ BAAQMD began monitoring PM_{2.5} concentrations in San Francisco in 2002. The federal 24-hour PM_{2.5} standard was not exceeded until 2006, when the standard was lowered from 65 $\mu\text{g}/\text{m}^3$ to 35 $\mu\text{g}/\text{m}^3$. It is estimated that the state 24-hour PM_{2.5} standard was exceeded on up to 54 days per year between 2009 and 2013. The state annual average standard was not exceeded between 2009 and 2013. In January 2013, USEPA increased the stringency of the PM_{2.5} standard by lowering it to 12 $\mu\text{g}/\text{m}^3$. The new standard is consistent with the state's PM_{2.5} standard.

Nitrogen Dioxide (NO₂)

NO₂ is a reddish-brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO₂. Aside from its contribution to ozone formation, NO₂ can increase the risk of acute and chronic respiratory disease and reduce visibility. NO₂ may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. Table 4.9-1 shows that the current state standard for NO₂ is being met in San Francisco. In 2010, USEPA implemented a new 1-hour NO₂ standard presented in Table 4.9-2. ARB recommended

² California Air Resources, Board. 2004. *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution*. January. Available: <http://www.wrapair.org/forums/amc/documents/PMNAAQS/Health_Effects_of_PM-03fs.pdf>. Accessed: March 3, 2014.

³ Bay Area Air Quality Management District. 1999. *CEQA Guidelines*. Available: <<http://www.baaqmd.gov/Divisions/Planning-and-Research/Planning-Programs-and-Initiatives/~media/8C1411130E9947DC939B618A43732FCF.ashx>>. Accessed: March 3, 2014.

⁴ PM₁₀ is sampled every sixth day; therefore, actual days over the standard can be estimated to be six times the numbers listed in the table.

that the SFBAAB be designated as an attainment area for the standard in 2010.⁵ This new federal standard was exceeded on one day at the Arkansas Street Station between 2009 and 2013.

Table 4.9-2 State and Federal Ambient Air Quality Standards and SFBAAB Attainment Status

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	U ^d	0.075 ppm	N/Marginal
Carbon Monoxide (CO)	1 hour	20 ppm	A	35 ppm	A
	8 hour	9.0 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	75 ppb	A
	24 hour	0.04 ppm	A	0.14 ppm	A
	Annual	NA	NA	0.030 ppm	A
Particulate Matter (PM10)	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 (PM2.5)	24 hour	NA	NA	35 µg/m ³	N
	Annual	12 µg/m ³	N	12.0 µg/m ³ ^g	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 µg/m ³	NA
Hydrogen Sulfide	1 hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	8 hour	See Note h	A	NA	NA

⁵ California Air Resources Board. 2011. *Recommended Area Designations for the 2010 Nitrogen Dioxide Standards, Technical Support Document*. January. Available: http://www.airquality.org/plans/federal/no2/NO2Enclosure_1.pdf. Accessed: March 3, 2014. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Case File No. 2010.0515E.

Table 4.9-2 State and Federal Ambient Air Quality Standards and SFBAAB Attainment Status

NOTES:

A = Attainment; N = Nonattainment; U = Unclassified; NA = Not Applicable, no applicable standard; ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter.

- ^a SAAQS = state ambient air quality standards (California). SAAQS for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, particulate matter, 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 three-year average of the fourth highest daily concentration is 0.08 ppm or less. The 24-hour PM10 standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour PM2.5 standard is attained when the three-year average of the 98th percentile is less than the standard.
- ^c The United States Environmental Protection Agency (USEPA) revoked the national 1-hour ozone standard on June 15, 2005.
- ^d This state 8-hour ozone standard was approved in April 2005 and became effective in May 2006.
- ^e State standard = annual geometric mean; national standard = annual arithmetic mean.
- ^f In June 2002, The California Air Resources Board (ARB) established new annual standards for PM2.5 and PM10.
- ^g On December 14, 2012, USEPA lowered the federal primary PM2.5 annual standard from 15.0 to 12.0 $\mu\text{g}/\text{m}^3$. The new annual standard became effective 60 days after publication in the Federal Register, which was published on January 15, 2013. The USEPA anticipates making initial attainment/nonattainment designations by December 2014, with those designations likely becoming effective in early 2015.
- ^h 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.

SOURCE: Bay Area Air Quality Management District. 2013. *Ambient Air Quality Standards*. Available: <<http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>>. Accessed: March 3, 2014.

USEPA has also established requirements for a new monitoring network to measure NO₂ concentrations near major roadways in urban areas with a population of 500,000 or more. Sixteen new near-roadway monitoring sites will be required in California, three of which will be in the Bay Area. These monitors were required to be deployed by January 2013. However, USEPA updated the implementation date for the monitors in March 2013. Two of the monitors are now required to be deployed by January 2014 and the third is required by January 2015.⁶ The new monitoring data may result in a need to change area designations in the future. ARB will revise the area designation recommendations, as appropriate, once the new monitoring data become available.

Sulfur Dioxide (SO₂)

SO₂ 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. SO₂ 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

⁶ Bay Area Air Quality Management District. 2013. *2012 Air Monitoring Network Plan*. July. Available: <http://www.baaqmd.gov/~media/Files/Technical%20Services/2012_Network_Plan.ashx>. Accessed: March 3, 2014.

and chronic respiratory disease.⁷ Table 4.9-1 shows that the state standard for SO₂ is being met in the Bay Area, and pollutant trends suggest that the air basin will continue to meet this standard for the foreseeable future. Monitoring data are not available after 2009, because SO₂ monitoring at the 16th and Arkansas Streets station was discontinued in 2009.

In 2010, USEPA implemented a new 1-hour SO₂ standard presented in Table 4.9-2. USEPA anticipates initially designating areas based on 2008–2010 monitoring data, or refined dispersion modeling results if provided by the state by June 2012. Similar to the new federal standard for NO₂, USEPA established requirements for a new monitoring network to measure SO₂ concentrations to be operational by January 2013.⁸ However, because the BAAQMD has never had a non-attainment designation for SO₂, no additional monitoring requirements are required for SO₂.⁶

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 puts 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, USEPA strengthened the national ambient air quality standard for lead by lowering it from 1.5 µg/m³ to 0.15 µg/m³. USEPA revised the monitoring requirements for lead in December 2010. These requirements focus on airports and large urban areas, resulting in an increase in 76 monitors nationally.⁹

■ Toxic Air Contaminants

Toxic air contaminants (TACs) are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Potential 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

⁷ Bay Area Air Quality Management District. 2012. *CEQA Air Quality Guidelines*. May. Available: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en>. p. C-16. Accessed: March 3, 2014.

⁸ U.S. Environmental Protection Agency. 2014. *Fact Sheet: Revisions to the Primary National Ambient Air Quality Standard, Monitoring Network, and Data Reporting Requirements for Sulfur Dioxide*. Available: <<http://www.epa.gov/air/sulfurdioxide/pdfs/20100602fs.pdf>>. Accessed: March 3, 2014. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Case File No. 2010.0515E.

⁹ U.S. Environmental Protection Agency. 2014. *Fact Sheet Revisions to Lead Ambient Air Quality Monitoring Requirements*. Available: <http://www.epa.gov/air/lead/pdfs/Leadmonitoring_FS.pdf>. Accessed: March 3, 2014.

present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

Construction activities typically require the use of heavy-duty diesel vehicles and equipment, which emit DPM, an identified TAC. 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 heavily traveled roadways. Other sources of health risks and hazards include gas stations, stationary diesel engines (i.e., backup generators), dry cleaners, crematories, spray booths, diesel-fueled railroads, major ports, railyards, airports, oil refineries, power plants, and cement plants.¹⁰

TACs do not have ambient air quality standards, but are regulated by BAAQMD using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances, to provide quantitative estimates of health risks.¹¹

In addition to monitoring criteria pollutants, both BAAQMD and ARB 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 have traditionally been found in the highest concentrations in ambient air and, therefore, tend to produce the greatest health risk. The BAAQMD operates an ambient TAC monitoring station at its 16th and Arkansas streets facility, which is the only monitoring site for air toxics in the City. Table 4.9-3 shows ambient concentrations of carcinogenic TACs measured at the 16th and Arkansas Streets station, as well as the estimated cancer risks from a lifetime exposure (70 years) to these substances. 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 Arkansas Street station do not appear to be any greater than for the Bay Area as a region.

¹⁰ Bay Area Air Quality Management District. 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May. Available: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Risk%20Modeling%20Approach%20May%202012.ashx?la=en>. Accessed: March 3, 2014.

¹¹ 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; then the applicant is subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, calculating the increased risk of cancer as a result of exposure to one or more TACs.

Table 4.9-3 Annual Average Ambient Concentrations of Carcinogenic toxic air contaminants Measured at 16th and Arkansas Streets Station

<i>Substance</i>	<i>Concentration</i>	<i>Cancer Risk per Million^a</i>
Gaseous TACs	(ppb)	
Acetaldehyde	0.68	3
Benzene	0.23	21
1,3-Butadiene	0.044	17
<i>para</i> -Dichlorobenzene	ND	ND
Carbon Tetrachloride	0.088	23
Formaldehyde	1.32	10
Perchloroethylene	0.018	0.7
Methylene Chloride	0.12	0.4
Chloroform	0.023	0.6
Trichloroethylene	0.01	0.1
Particulate TACs	(ng/m ³)	
Chromium (Hexavalent)	0.05	8
Total Risk for All TACs		73.8

NOTES:

TACs = toxic air contaminants; BAAQMD = Bay Area Air Quality Management District; ppb = part per billion; ng/m³ = nanograms per cubic meter.

a Cancer risks were estimated by applying published unit risk values to the measured concentrations.

SOURCE: California Air Resources Board. 2011. *Ambient Air Toxics Summary-2011*. Available: <<http://www.arb.ca.gov/aaqm/toxics.htm>>. Accessed: March 3, 2014.

b ND: No data

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 also contribute to particulates by generating road dust and through tire wear. Epidemiologic studies¹² have demonstrated that people living in proximity 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 particulate matter and nitrogen dioxide. In traffic-related studies, the additional non-cancer health

¹² San Francisco Department of Public Health. 2008. *Assessment and Mitigation of Air Pollutant Health Effect from Intra-urban Roadways: Guidance for Land Use Planning and Environmental Review*. May. p. 7. Available: <<http://www.sfpbes.org/component/jdownloads/finish/3-air/90-assessment-and-mitigation-of-air-pollutant-health-effects-from-intra-urban-roadways-guidance-for-land-use-planning-and-environmental-review/0?Itemid=62>>. Accessed: March 3, 2014. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Case File No. 2010.0515E.

risk attributable to roadway proximity was seen within 1,000 feet of the roadway and was strongest within 300 feet.¹³ In 2008, the City of San Francisco adopted amendments to the *San Francisco Health Code* (discussed in Section 5.9, *Air Quality*), requiring new residential projects near high-volume roadways to be screened for particulate matter exposure hazards and, where indicated, to conduct an analysis of exposure and to reduce indoor particulate matter exposure through building design and ventilation.

Diesel Particulate Matter (DPM)

ARB identified diesel particulate matter (DPM) as a toxic air contaminant 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 heavily traveled highways. ARB estimated that the average Bay Area cancer risk from exposure to diesel particulate, based on a population-weighted average ambient diesel particulate concentration, is about 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 ARB, declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, ARB estimated the average statewide cancer risk from DPM at 480 in one million.^{14,15}

In 2000, ARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. Subsequent ARB regulations apply to new trucks and to 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 1988.¹⁶ The regulation is anticipated to result in an 80-percent decrease in statewide diesel health risk in 2020 as compared to the diesel risk in 2000. Despite notable emission reductions, ARB recommends that proximity to sources of DPM emissions be considered in the siting of new sensitive land uses. With careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, ARB's position is that infill development, mixed use, higher density, transit-oriented development, and

¹³ California Air Resources Board. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April. p. 6. Available: <<http://www.arb.ca.gov/ch/handbook.pdf>>. Accessed: March 3, 2014.

¹⁴ California Air Resources Board. 2009. *California Almanac of Emissions and Air Quality-2009 Edition*, Table 5-44 and Figure 5-12. Available: <<http://www.arb.ca.gov/aqd/almanac/almanac09/chap509.htm>>. Accessed: March 3, 2014.

¹⁵ 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 is 38 percent for females and 44 percent for males, according to the American Cancer Society. (American Cancer Society. 2013. *Lifetime Probability of Developing or Dying from Cancer*. September 05. Available: <<http://www.cancer.org/cancer/cancerbasics/lifetime-probability-of-developing-or-dying-from-cancer>>.

¹⁶ Pollution Engineering. 2006. *New Clean Diesel Fuel Rules Start*. July. Available: <<http://www.pollutionengineering.com/articles/85480-new-clean-diesel-fuel-rules-start>>. Accessed: March 3, 2014.

other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.¹⁷

Naturally Occurring Asbestos

As noted in Section 4.16, *Geology and Soils*, serpentine bedrock is present on existing cut slopes and in sporadic outcrops within and immediately adjacent to the site. The most extensive areas of serpentine outcrops occur as linear features on the south side of 26th Street, on the west side of Wisconsin Street south of Carolina Street, along 23rd Street, and along Texas Street. Serpentine bedrock is also in underlying materials at a minimum depth of 2.5 feet below ground surface and at maximum depths of 11 to 15 feet in the area of fill along Connecticut Street.¹⁸ Serpentine rock can contain concentrations of naturally occurring asbestos (NOA)¹⁹ at concentrations less than one percent and up to approximately 25 percent. Laboratory analysis indicates that the serpentine bedrock at the Project site contains chrysotile, a mineral found in asbestos, as a result of the weathering of serpentine found within the underlying Franciscan bedrock.²⁰

As long as chrysotile and other asbestos minerals are not disturbed and fibers are not released into the air, no health risk exists. However, through construction activities, such as excavation and grading, as well as natural weathering processes, NOA can be released into the air. Exposure to airborne asbestos fibers from NOA may result in lung disease or other pulmonary complications.

■ 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. BAAQMD defines sensitive receptors as children, adults, and seniors occupying or residing in residential dwellings, schools, colleges and universities, day care, hospitals, and senior-care facilities. Workers are not considered sensitive receptors because all

¹⁷ California Air Resources Board. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April. p. 6. Available: <<http://www.arb.ca.gov/ch/handbook.pdf>>. Accessed: March 3, 2014.

¹⁸ ENGEO Incorporated. 2009. *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA, Figure 5*. July 10. (See Appendix 4.16). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁹ "Asbestos" is a term used for several types of naturally occurring fibrous minerals found in many parts of California.

²⁰ ENGEO Inc. 2009. *Geotechnical Exploration, Potrero Annex and Terrace Redevelopment San Francisco, CA*. July 10. San Francisco, CA. (See Appendix 4.16). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

employers must follow regulations set forth by the Occupation Safety and Health Administration (OSHA) to ensure the health and well-being of their employees.²¹

As discussed in Chapter 2, *Project Alternatives and Project Description*, the Project area has residential and school/daycare land uses both on the Project site and adjacent to it. The closest school is Starr King Elementary School, located approximately 60 feet west of the Project site directly across Wisconsin Street. Residential land uses surround the Project site to the west, west of Wisconsin Street, and to the north, north of 23rd Street and to the north along both the east and west sides of Missouri Street. The nearest residential receptors are located adjacent to the Project boundaries, just east of Wisconsin Street. Additionally, there are residential land uses east of Texas Street and north of 25th Street that would be adjacent to construction activities.

■ Existing Stationary Sources of Local Air Pollution

While most of San Francisco is endowed with good air quality, portions of the City that are close to freeways, busy roadways, and other sources of air pollution experience much higher concentrations of air pollutants. These air pollution exposure areas result in additional health risks for affected populations.

In an effort to identify air pollution exposure areas, San Francisco has partnered with the BAAQMD to inventory and assess air pollution and exposures from mobile, stationary, and area sources within San Francisco. This modeling effort includes dispersion modeling of emissions from the primary sources of air pollutants in San Francisco and therefore, represents a comprehensive assessment of cumulative exposures to air pollution throughout the City. The BAAQMD has conducted dispersion modeling using AERMOD²² to assess the emissions from the following primary sources: roadways, permitted stationary sources, port and maritime sources, and Caltrain. PM₁₀, PM_{2.5}, and total organic gases (TOG) were modeled on a 20 meter by 20 meter receptor grid covering the entire City.²³

Using the citywide air pollution model, areas with higher concentrations of TACs, termed the “air pollution exposure zone,” were identified based on two health-protective criteria: (1) excess cancer risk from the contribution of emissions from all modeled sources greater than 100 per one million

²¹ Bay Area Air Quality Management District. 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May. Available:

<<http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Risk%20Modeling%20Approach%20May%202012.ashx?la=en>>. Accessed: March 3, 2014.

²² AERMOD is the USEPAs preferred/recommended steady state air dispersion plume model. For more information on AERMOD and to download the AERMOD Implementation Guide, see:

<http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod>.

²³ Bay Area Air Quality Management District, San Francisco Department of Public Health, and San Francisco Planning Department. 2012. *The San Francisco Community Risk Reduction Plan: Technical Support Documentation*. December. San Francisco, CA.

persons exposed, and (2) cumulative PM_{2.5} concentrations in excess of 10 µg/m³. These criteria are further discussed in Section 5.9 *Air Quality*.

The Project site is located in an area with relatively low annual average PM_{2.5} concentrations: annual average PM_{2.5} concentrations are less than 9 µg/m³. Cancer risk near the Project site is also relatively low, with a risk of less than 50 cases per 1,000,000. These indicators suggest that there are relatively few sources that contribute to PM_{2.5} concentrations and excess cancer risk.

■ **Odor Emissions**

Odor sources include land uses such as wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants. The Project site is approximately 0.6 mile northwest of the Southeast Treatment Plant, a large wastewater treatment plant that handles approximately 80 percent of San Francisco's wastewater.²⁴ This distance (0.6 mile) would be the shortest distance between the Project area and treatment plant, and was measured using the straight line distance between the residential units at the corner of 26th Street and Connecticut Street and the northern most wastewater clarifier at the Southeast Treatment Plant, where partially treated wastewater sits uncovered. The entire Project area would be within 1 mile of the nearest wastewater clarifier.

The topography between the treatment plant and the Project area is relatively flat, with an elevation profile that increases by approximately 45 feet from the treatment plant northward to the southern boundary of the Project area. The elevation profile of the Project area then becomes more dramatic, increasing by 250 feet between the southern and northern boundaries of the Project area, which is a distance of approximately 0.4 mile from the treatment plant.

The landscape of the area between the Project area and treatment plant consists of commercial and industrial buildings, parking lots, vehicle storage yards, local roads, a major interstate (I-280), and a narrow branch of San Francisco Bay. There is little vegetated or natural land between the Project area and the treatment plant.

The predominant wind direction in the area of the Southeast Treatment Plant is from the west and southwest.

Odor Complaint History of the Southeast Treatment Plant

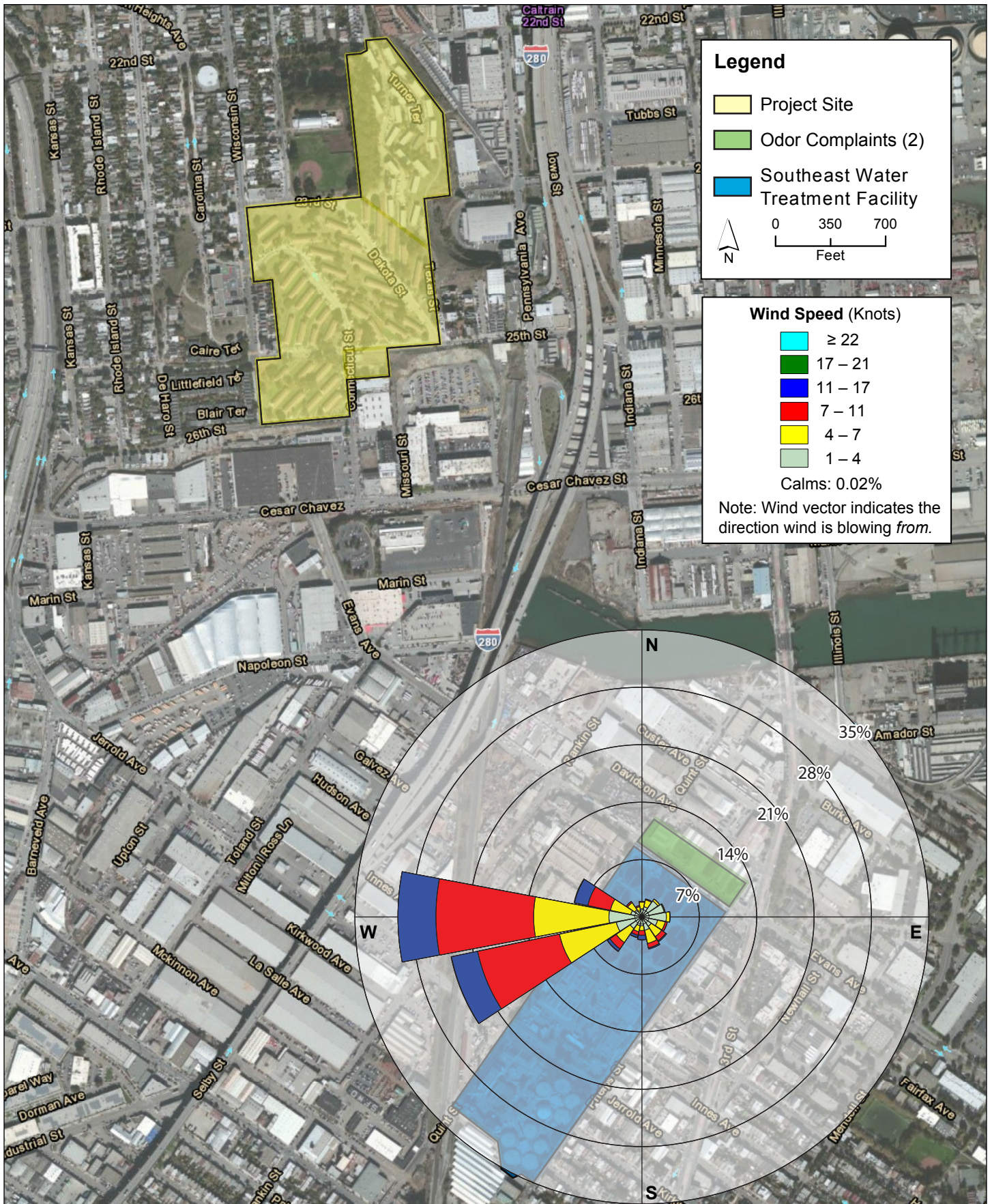
The odor complaint history of the Southeast Treatment Plant was obtained from the BAAQMD, and it was found that there have been three confirmed complaints associated with the treatment plant between 2011 and 2013. All three complaints were received by the BAAQMD in 2012. Two

²⁴ San Francisco Public Utilities Commission. 2014. *Southeast Treatment Plant*. Available: <<http://sfwater.org/index.aspx?page=616>>. Accessed: March 3, 2014.

complaints occurred from complainants on the 1600 block of Evans Avenue in San Francisco, and the location of the third complainant is unknown.

The two complaints that originated from the 1600 block of Evans Avenue are adjacent to the Southeast Treatment Plant. The façade of the buildings on the 1600 block of Evans Avenue are within 200 feet to the northeast of the wastewater clarifiers at the treatment plant. There is a fence around the treatment plant that is approximately 8 to 10 feet high that separates the wastewater clarifiers from the buildings. The land between the clarifiers and the buildings along the 1600 block of Evans Avenue is flat and includes landscaped grass and paved surface. In addition, meteorological data at the nearest weather station indicates that the prevailing wind direction in the area is from the west/southwest.

Figure 4.9-1 shows the prevailing wind direction, the locations of the treatment plant, confirmed complaints associated with the treatment plant, and the Project site. Although there have been three confirmed complaints associated with the Southeast Treatment Plant over the previous five years, the location of one confirmed complaint is unknown; thus, only two confirmed complaints are shown in Figure 4.9-1.



SOURCE: ICF, 2014.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.9-1: CONFIRMED ODOR COMPLAINTS ASSOCIATED WITH THE SOUTHEAST TREATMENT PLANT AND PREDOMINANT WIND DIRECTION IN THE PROJECT VICINITY

4.10 GREENHOUSE GAS EMISSIONS

4.10.1 Introduction

This section provides a description of global climate change, greenhouse gas (GHG) emissions, the existing regulatory framework governing GHG emissions, and an analysis of the impacts related to GHGs associated with development of the Proposed Project. The Proposed Project's GHG emissions are evaluated based on compliance with plans and policies adopted for the purpose of reducing GHG emissions, namely the City's local GHG reduction plan, *Strategies to Address Greenhouse Gas Emissions*.¹ Comments regarding tree removal were submitted during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods. This issue is addressed in Section 5.10, *Greenhouse Gas Emissions*.

4.10.2 Environmental Setting

■ Sources of Greenhouse Gas Emissions

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 like a greenhouse does. The accumulation of GHGs has been implicated as the driving force for global climate change. The primary GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone, and water vapor. Black carbon has recently emerged as a major contributor to global climate change, possibly second only to CO₂.

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operational phases. While the presence of the primary GHGs in the atmosphere is naturally occurring, CO₂, CH₄, and N₂O are largely emitted from human activities, accelerating the rate at which these compounds accumulate in the earth's atmosphere. Emissions of CO₂ are largely byproducts of fossil fuel combustion, whereas CH₄ is a component of natural gas and also a byproduct of off-gassing associated with agricultural practices and landfills. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass.² N₂O is a byproduct of various industrial processes and has a number of uses, including use as an anesthetic and as an aerosol propellant. Other GHGs include

¹ City and County of San Francisco. 2010. *Strategies to Address Greenhouse Gas Emissions*. November. Available: <http://sfmea.sfplanning.org/GHG_Reduction_Strategy.pdf>. Accessed August 22, 2012.

² Center for Climate and Energy Solutions. 2010. *What is Black Carbon?* April. Available: <<http://www.c2es.org/docUploads/what-is-black-carbon.pdf>>. Accessed: August 24, 2012.

hydrofluorocarbons (HFCs), perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. GHGs are typically reported in “carbon dioxide equivalent” (CO₂E) measures.³

■ **Potential Effects of Human Activity on GHG Emissions**

There is international scientific consensus that human-caused increases in GHGs have contributed and will continue to contribute to global warming, although there is uncertainty concerning the magnitude and rate of the warming. Many impacts resulting from climate change, including increased fires, sea level rise, floods, severe storms, and heat waves, already occur and will only become more frequent and more costly.⁴ Secondary effects of climate change are likely to include impacts to agriculture, water resources, the state’s electricity system, and native freshwater fish ecosystems, an increase in the vulnerability of levees in the Sacramento–San Joaquin Delta, changes in disease vectors, and changes in habitat and biodiversity.^{5,6}

Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO₂ emissions (and, thus, substantial increases in atmospheric concentrations). Atmospheric CO₂ concentrations have increased by 40 percent above pre-industrial concentrations.⁷

As the California Air Resources Board’s (ARB) Climate Change Scoping Plan noted, in enacting Assembly Bill (AB) 32, the legislature found that global warming would cause detrimental effects to some of the state’s largest industries, including agriculture, winemaking, tourism, skiing, commercial and recreational fishing, forestry, and electrical power generation. The Climate Change Scoping Plan states:⁸

“The impacts of global warming are already being felt in California. The Sierra snowpack, an important source of water supply for the state, has shrunk 10 percent in the last 100

³ Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in terms of “carbon dioxide-equivalent” (CO₂E) to account for each gas’s heat absorption or global warming potential.

⁴ State of California. 2012. *California Climate Change Portal*. Available: <<http://www.climatechange.ca.gov/>>. Accessed: September 25, 2012.

⁵ State of California. 2012. *California Climate Change Portal*. Available: <<http://www.climatechange.ca.gov/>>. Accessed: September 25, 2012.

⁶ California Climate Change Center. 2012. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California*, CEC-500-2012-007. July. Available: <<http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>>. Accessed: August 21, 2012.

⁷ Intergovernmental Panel on Climate Change. 2013. *Climate Change 2013: The Physical Science Basis – Summary for Policy Makers*. Page 11. Available: <http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf>. Accessed: August 5, 2014.

⁸ California Air Resources Board. 2011. *Climate Change Scoping Plan*. Adopted December 11, 2008; re-approved August 24, 2011. Sacramento, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Project Case File No. 2010.0515E.

years. It is expected to continue to decrease by as much as 25 percent by 2050. World-wide changes are causing sea levels to rise—about 8 inches of increase has been recorded at the Golden Gate Bridge over the past 100 years—threatening low coastal areas with inundation and serious damage from storms.”

■ **Impacts of Climate Change**

Ecosystem and Biodiversity Impacts

Climate change affects diverse types of ecosystems, from oceans to forests.⁹ As temperatures and precipitation change, seasonal shifts in vegetation would occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The Intergovernmental Panel on Climate Change states that “20 percent to 30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3°C (3.6 to 5.4°F) relative to pre-industrial levels.”¹⁰ Shifts in existing biomes could also make ecosystems vulnerable to encroachment by invasive species. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.

Human Health Impacts

Climate change may increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects such as malaria, dengue fever, yellow fever, and encephalitis.¹¹ Cholera, which is associated with algal blooms, could also increase. While these health impacts would largely affect tropical areas in other parts of the world, effects would also be felt in California. Warming of the atmosphere would be expected to increase smog and particulate pollution, which

⁹ Michelle D. Staudinger, Nancy B. Grimm, Amanda Staudt, Shawn L. Carter, F. Stuart Chapin III, Peter Kareiva, Mary Ruckelshaus, Bruce A. Stein. 2012. *Impacts of Climate Change on Biodiversity, Ecosystems, and Ecosystem Services: Technical Input to the 2013 National Climate Assessment*. Cooperative Report to the 2013 National Climate Assessment. 296 p. Available: <<http://assessment.globalchange.gov>>. Accessed: March 2, 2014.

¹⁰ Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom. Available: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4_wg2_full_report.pdf>. Accessed: March 2, 2014. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Project Case File No. 2010.0515E.

¹¹ Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom. Available: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4_wg2_full_report.pdf>. Accessed: March 2, 2014. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Project Case File No. 2010.0515E.

could adversely affect individuals with respiratory problems, such as asthma¹². Extreme heat events would also be expected to occur with more frequency and could adversely affect the elderly, children, and the homeless¹³. Finally, the water supply impacts and seasonal temperature variations expected as a result of climate change, could affect the viability of existing agricultural operations, making the food supply more vulnerable.¹⁴

Greenhouse Gas Emissions Estimates

Global Emissions

Worldwide emissions of GHGs in 2005 were 39 billion tons of CO₂E per year.¹⁵ This includes both ongoing emissions from industrial and agricultural sources but excludes emissions from land use changes.

U.S. Emissions

In 2009, the United States emitted about 6.7 billion tons of CO₂E or about 21 tons per year per person. Of the four major sectors nationwide — residential, commercial, industrial, and transportation — transportation accounts for the highest fraction of GHG emissions (approximately 33 percent); these emissions are entirely generated from direct fossil fuel combustion.¹⁶

State of California Emissions

The ARB estimated that in 2010 California produced about 452 million gross metric tons (MMT CO₂E; about 498 million U.S. tons) of CO₂E.¹⁷ The ARB found that transportation is the source of 38 percent of the state's GHG emissions, followed by electricity generation (both in-state and out-

¹² U.S. Environmental Protection Agency. 2013. Climate Change – Impacts & Adaptation – Human Health. Available: <<http://www.epa.gov/climatechange/impacts-adaptation/health.html>>. Accessed: August 5, 2014.

¹³ Centers for Disease Control. Climate Change and Extreme Heat Events. Available: <<http://www.cdc.gov/climateandhealth/pubs/ClimateChangeandExtremeHeatEvents.pdf>>. Accessed: August 5, 2014.

¹⁴ Food and Agriculture Organization of the United Nations. 2011. Climate Change, Water and Food Security. Available: <<http://www.fao.org/docrep/014/i2096e/i2096e.pdf>>. Accessed: August 5, 2014.

¹⁵ United States Environmental Protection Agency. 2013. *Climate Change Indicators in the United States, Global Greenhouse Gas Emissions*. Available: <<http://www.epa.gov/climatechange/science/indicators/ghg/global-ghg-emissions.html>>. Accessed: April 29, 2013. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Project Case File No. 2010.0515E.

¹⁶ United States Environmental Protection Agency. 2011. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009; Executive Summary*. Available: <<http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2011-Executive-Summary.pdf>>. Accessed: March 3, 2014. This document is available for review at the Planning Department, 1650 Mission Street, San Francisco, California, Suite 400, in Project Case File No. 2010.0515E.

¹⁷ The abbreviation for “million metric tons” is MMT; thus, “million metric tons of CO₂ equivalents is written as MMT CO₂E.

of-state) at 21 percent and industrial sources at 19 percent. Commercial and residential fuel use (primarily for heating) accounted for 10 percent of GHG emissions.¹⁸

Bay Area Emissions

In San Francisco, on-road transportation (vehicles on highways, city streets, and other paved roads) and natural gas (consumption for residential, commercial, and industrial use) sectors were the two largest sources of GHG emissions, accounting for approximately 40 percent (2.1 MMTCO₂E) and 29 percent (1.5 MMTCO₂E), respectively, of San Francisco's 5.3 MMTCO₂E emitted in 2010. Electricity consumption (residential, commercial, municipal buildings, and BART and Muni transportation systems) accounts for approximately 25 percent (1.3 MMTCO₂E) of San Francisco's GHG emissions.¹⁹

Electricity in San Francisco is currently primarily provided by Pacific Gas & Electric (PG&E) and the San Francisco Public Utilities Commission (SFPUC). In 2010, electricity consumption in San Francisco was approximately 6.1 million megawatt-hours (MWh), accounting for approximately 25 percent (1.3 MMTCO₂E) of San Francisco's total 2010 GHG emissions. Of those totals, PG&E produces approximately 73 percent of electricity distributed (4.5 million MWh), accounting for approximately 79 percent (1.1 MMTCO₂E) of GHG emissions, and the SFPUC produces approximately 14 percent (0.9 million MWh) of electricity distributed, accounting for 0.01 percent (12,489 MTCO₂E) of GHG emissions.^{20,21}

In 2010, PG&E's total power mix was as follows: 20 percent natural gas, 24 percent nuclear, 16 percent eligible renewables (described below), 16 percent large hydroelectric, 23 percent unspecified power, one percent coal, and one percent other fossil fuels.²² Pending California Public Utilities Commission approval, PG&E would include a "Green Option" program that would allow

¹⁸ California Air Resources Board. 2013. *California Greenhouse Gas Inventory for 2000-2010—by Category as Defined in the Scoping Plan*. Available: <http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-10_2013-02-19.pdf>. Accessed: April 29, 2013. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Project Case File No. 2010.0515E.

¹⁹ California Air Resources Board. 2013. *California Greenhouse Gas Inventory for 2000-2010—by Category as Defined in the Scoping Plan*. Available: <http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-10_2013-02-19.pdf>. Accessed: April 29, 2013. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Project Case File No. 2010.0515E.

²⁰ San Francisco Department of Environment (DOE), *San Francisco Climate Action Strategy, 2013 Update*.

²¹ Bay Area Air Quality Management District. 2008. *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007*. December. Available: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory_2007_003_000_000_000.ashx>. Accessed: March 3, 2014. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, in Project Case File No. 2010.0515E.

²² Pacific Gas & Electric (PG&E), "PG&E's 2010 Electric Power Mix Delivered to Retail Customers." Available: <<http://www.pge.com/myhome/edusafety/systemworks/electric/energymix/>>. Accessed: June 10, 2013 (2013a).

customers an opportunity to pay into a program that may lead to the development of up to 250 MW of new clean energy projects in the PG&E service area.²³

SFPUC provides energy supplies produced from three hydroelectric power plants that the SFPUC owns and operates in association with San Francisco's Hetch Hetchy water supply and distribution system. This system has the lowest GHG emissions of any large electric utility in California and currently supplies electricity for use by Muni, city buildings, and a limited number of other commercial accounts.²⁴

²³ PG&E, "New Green Option (Community Solar) FAQ." Available:

<<http://www.pge.com/about/environment/pge/greenoption/faq>>. Accessed: June 10, 2013 (2013b).

²⁴ San Francisco Public Utilities Commission (SFPUC), "Agenda Item No 20, Adopt an Enforcement Program as required under the California Renewable Energy Resources Act," December 13, 2011. Available:

<http://www.energy.ca.gov/portfolio/rps_pou_reports.html>. Accessed: June 10, 2013.

4.11 WIND AND SHADOW

4.11.1 Introduction

This section describes the wind and shadow setting in San Francisco and the Project area. Because wind and shadow contribute substantially to the San Francisco environment and can be highly susceptible to an impact from development, these issues are analyzed as part of CEQA review in San Francisco. Several wind-related issues were raised during the Notice of Preparation (NOP) and scoping period. Specifically, comments were made regarding new wind patterns resulting from a realigned street grid, wind resulting from taller buildings on the site, and shadow effects on existing off-site residential uses on 25th Street and at the intersection of 25th and Wisconsin Streets. No comments related to wind and shadow were received during the Notice of Intent (NOI) scoping period. These areas of concern will be addressed in Section 5.2, *Land Use and Planning*.

4.11.2 Environmental Setting

■ Wind

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. Meteorological data measured at the San Francisco Airport and averaged from 2006 to 2013 shows that winds from the northwest, west-northwest, west, and west-southwest, reflecting the persistence of sea breezes, are the most prevalent 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. Typically, the highest wind speeds occur during the mid-afternoon and the lowest wind speeds occur during the early morning.

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. 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 much taller than those around it, 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 unusual shapes or are more geometrically complex tend to have lesser effects.

The orientation or profile of a building can also affect wind speeds. When the wide face of a building, as opposed to its narrow face, is oriented toward the prevailing wind direction, the building has more surface area to intercept and redirect winds down to ground level.

Wind Speed and Pedestrian Comfort

The comfort of pedestrians varies under different conditions of sun exposure, temperature, 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, 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.

Winds vary at pedestrian levels within a city. In San Francisco, wind strength is generally greater, on average, along streets that run east-west as buildings tend to channel westerly winds along these streets. Streets running north-south tend to have lighter winds, on average, due to the shelter offered by buildings on the west side of the street. The Potrero Hill neighborhood is mainly on a north-south and east-west grid.

■ Shadow

Shadow Terminology

Shadow is an important environmental issue because the users or occupants of certain land uses, such as residential, recreational/parks, churches, schools, outdoor restaurants, and pedestrian areas have some reasonable expectations for direct sunlight and warmth from the sun. These land uses are termed "shadow-sensitive." Shadow lengths are dependent on the height and size of the building or object from which they are cast and the angle of the sun. The angle of the sun varies with the time of day and change in seasons. The longest shadows are cast during the winter months and the shortest shadows are cast during the summer months.

In San Francisco, the presence of the sun's warming rays is essential to enjoying open space. Climatic factors, including ambient temperature, humidity, and wind, often combine to create a comfortable climate only when direct sunlight is present. Therefore, the shadows created by new development can critically diminish the utility of the open space. This problem is more acute in the Downtown area and in adjacent neighborhoods, where there is a limited amount of open space, pressure for new development, and zoning controls that allow tall buildings.

Potrero Hill Recreation Center

Within the Potrero Hill District area¹ there are five children's play areas², two dog play areas³, three community gardens,⁴ a recreation center, and open space. Adjacent to the Project site is the Potrero Hill Recreation Center. The entire Potrero Hill Recreation Center is 9.54 acres. As shown in Figure 4.12-1 in Section 4.12, *Recreation*, the Potrero Hill Recreation Center includes the Potrero Hill Children's Play Areas, the Potrero Hill Recreation Center Dog Play Area, the Tot Play Area, baseball/softball/soccer fields, two tennis courts, a basketball court, picnic area, walking paths, and an indoor recreation center that includes an auditorium, stage, and gym with programming for youths, adults, and seniors. Mature trees that vary in height from approximately 10 to 30 feet exist along the perimeter of the park, with large concentrations in the eastern and northern perimeters.

The indoor recreation center is open between 9:00 a.m. and 9:00 p.m., Tuesday through Friday, and on Saturday between 9:00 a.m. and 5:00 p.m. The recreation center and the ball fields are locked and closed on Sunday and Monday; however, during summer the Recreation Center is open Monday between 9:00 a.m. and 5:00 p.m. The Recreation Center buildings and sports fields are locked and closed outside of operating hours. However, the dog play area, children's play areas, tennis courts, and basketball court are not restricted. All park hours are enforced by Park Patrol for the Recreation Center and sports fields.

Additionally, two parks, McKinley Square and Jackson Playground, are located near the Project site. McKinley Square is an approximately 2.81-acre park located 0.40 mile west of the Project site. This park is accessible to the public and includes a playground, dog play area, community garden, and open space. Jackson Playground is an approximately 4.41-acre park located 0.50 mile north of the Project site. This park is also accessible to the public and includes a playground, picnic areas, tennis courts, basketball courts, and two ball fields. McKinley Square and Jackson Playground are not within reach of shadows cast by the current buildings at the Project site. There are no privately-owned public open spaces (POPOS) within the Project vicinity.⁵

¹ The Potrero Hill District is bordered by 16th Street to the north, Potrero Avenue and U.S. Route 101 (below 20th Street) to the west, Interstate 280 to the east, and Cesar Chavez Street to the south.

² The five play areas in the district are Potrero Hill Recreation Center Children's Play Area, Potrero Hill Recreation Center Tot Play Area, Jackson Playground Children's Play Area, Jackson Playground Tot Play Area, and McKinley Square Children's Play Area.

³ The two dog play areas are Potrero Hill Dog Play Area at Potrero Hill Recreation Center and McKinley Square Dog Play Area.

⁴ The three gardens are the Potrero Hill Community Garden located at McKinley Square, the Connecticut Friendship Garden (land owned by the Department of Public Works [DPW]; managed by the Recreation and Park Department [RPD]), and the Arkansas Friendship Garden (land owned by DPW; managed by RPD).

⁵ San Francisco Planning Department. 2013. Privately-Owned Public Open Space and Public Art. <<http://www.sf-planning.org/index.aspx?page=3339>> October. Accessed March 2, 2014.

San Francisco has a temperate climate that allows Potrero Hill Recreation Center's parks tennis courts, basketball courts, baseball fields, and other amenities to be open year-round. According to the Recreation and Park Department, the park and its various amenities generally have a consistent demand throughout the year.⁶ However, for some amenities, demand is heavier depending on the season. For example, during the winter, the basketball court in the recreation center building is booked on most days. Similarly, the baseball fields are booked many weekdays and most weekends during the spring and summer baseball season. After-school activity groups and summer camps actively use the Potrero Hill Recreation Center.

Potrero Hill Recreation Center has 1,546,911,552 square feet hours of Theoretically Available Annual Sunlight ("TAAS"), which is the amount of theoretically available sunlight on the park, annually, if there were no shadows from structures, trees, or other facilities. Shadows currently exist on the Potrero Hill Recreation Center, primarily in the morning and midday hours along the southern and western boundaries of the park.⁷ The existing shadow load for the Potrero Hill Recreation Center is 155,558,367 square foot hours annually. This is 10.06 percent of the total TAAS for the Potrero Hill Recreation Center.

The existing shadow on the Potrero Hill Recreation Center is caused by the recreation center building located in the park.⁸ That building is approximately 25 feet high and casts a shadow across the park throughout the year.⁹ In the winter, the residential buildings along Arkansas Street cast a shadow along the western edge of the park that reaches a small part of the ball fields and the children's play area in the northwest corner of the Potrero Hill Recreation Center.

During the spring and autumn, Potrero Hill Recreation Center is sunny from approximately 10:00 a.m. to 5:00 p.m.; however, the toddler play area of the park is shadowed by the recreation center building during the late afternoon and early evening. Existing buildings shadow the walking paths along the northeastern edge of the park during the early morning. At noon and during the afternoon (around 3:00 p.m.), the park is mostly without shadows.

During the summer, Potrero Hill Recreation Center is sunny from approximately 9:00 a.m. to 6:00 p.m.; however, the toddler play area is shadowed by the recreation center building during the late afternoon and early evening. At noon and in the afternoon (3:00 p.m.), the park is mostly without shadows.

⁶ Recreation and Park Department. 2014. Potrero Hill Recreation Center. Personal Communications with front desk attendant. February 27.

⁷ The Potrero Hill Recreation Park is 415,680 square feet.

⁸ Shadow analysis for the purpose of this document takes into account shadows created by buildings rather than by trees.

⁹ CADP. 2014. *Potrero HOPE SF Master Plan EIR/EIS Shadow Analysis*. February. The shadow calculations and diagrams are available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

During the winter, Potrero Hill Recreation Center is mostly sunny from approximately 10:00 a.m. to 3:00 p.m.; however, the toddler play area and walking paths are shadowed by the recreation center building during the early morning, late afternoon, and early evening. The western edge of the park and a small portion of the ball field are shadowed by existing residential buildings along Arkansas Street and 23rd Street during the afternoon and early evening. At noon, open space to the north of the recreation center building is shadowed.

During sunrise on December 20th, open space to the northwest of the recreation center building is shadowed and the walking paths on the northeastern edge of the park are shadowed by existing buildings. During sunrise on September 20th and March 20th, open space to the west of the recreation center building is shadowed and walking paths on the northeastern edge of the park are shadowed by existing buildings.

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4.12 RECREATION

4.12.1 Introduction

This section describes existing recreational facilities in San Francisco and within the vicinity of the Project site. Several recreation issues were raised during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods. Specifically, comments were made regarding the degradation of existing recreational resources, including the neighboring Potrero Hill Recreation Center. These areas of concern will be addressed in this section.

4.12.2 Environmental Setting

For purposes of this Draft EIR/EIS, parks are generally defined as areas of land set aside for various recreational opportunities for the public. Recreational facilities are those structures and/or improvements that are built at parks (e.g., benches, picnic tables, tennis courts, etc.). Open space areas are typically unimproved parkland. Therefore, parks and recreational facilities are typically used interchangeably, whereas open space areas refer to those areas where the land is either kept in its natural state or enhanced in order to return the land to its natural state. However, when calculating the city's overall park acreage, open space areas are considered part of the total.

■ Citywide Resources

Property in San Francisco that is permanently dedicated to publicly accessible park and recreational uses totals approximately 4,090 acres.¹ According to the 2010 Census, the city had a population of 805,235 residents in 2010,² yielding a ratio of approximately 5.08 acres of open space per 1,000 San Francisco residents. The City has not established a citywide target ratio of parkland to residents, nor has it adopted a Quimby Act ordinance requiring land dedications or in-lieu fees, because San Francisco's population density, small land mass, and other development constraints make such policies infeasible.

A majority of local-serving parks and recreation facilities within San Francisco are owned and operated by the San Francisco Recreation and Park Department (SFRPD). The SFRPD maintains over 220 parks, playgrounds, and open spaces throughout the city, which function mainly for neighborhood use. The park system also includes 25 large, full-complex recreation centers, nine

¹ San Francisco Planning Department. 2014. *San Francisco General Plan, Recreation and Open Space Element*. April. Available: <http://openspace.sfplanning.org/docs/Recreation-and-Open-Space-Element-APRIL-2014-ADOPTED.pdf>. Accessed: May 22, 2014). This number includes SFRPD, state and federal open space land in the City and County of San Francisco.

² U.S. Census Bureau. 2014. *American Fact Finder, 2010 Demographic Profile Data, County of San Francisco*. Available: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. Accessed February 26, 2014.

swimming pools, and five golf courses, as well as numerous tennis courts, baseball diamonds, athletic fields, and basketball courts. The SFRPD also manages the Marina Yacht Harbor, Candlestick Park, the San Francisco Zoo, and the Lake Merced Community Complex. The SFRPD currently owns and manages a total of approximately 3,433 acres of recreational and open space.³ The State owns approximately 255 acres at the Candlestick Point State Recreation Area and Mount Sutro Open Space and the federal government owns approximately 1,642 acres, primarily at the Presidio, which are managed by the U.S. Department of Interior's National Park Service (NPS) as part of the Golden Gate National Recreation Area (GGNRA). In addition, there are 560 additional acres of recreation and open space areas within San Francisco including campuses, pilot program schoolyards, SFPUC lands, San Francisco Redevelopment Agency parks, San Francisco Port parks, linear open spaces such as boulevards and parkways, and privately owned, publicly accessible open spaces in Downtown.⁴

The Project site is located in the Tenth Supervisorial District (District 10), within the Potrero Hill neighborhood. The Potrero Hill neighborhood is located on the eastern border of San Francisco. District 10 consists of Bayview-Hunters Point, Candlestick Point, Dogpatch, India Basin, Little Hollywood, McLaren Park, part of the Portola, Potrero Hill, Silver Terrace, Sunnydale and Visitación Valley and includes 458 acres of parks and open space.⁵ Due to the scarcity and high cost of vacant land in San Francisco, existing recreation facilities represent a major city resource.⁶ As opportunities to acquire new parkland and develop recreation facilities are limited, the Recreation and Open Space Element of San Francisco's General Plan has identified high-need areas which are given highest priority for the construction of new parks and recreation improvements. The Potrero Hill neighborhood has not been identified as high need area in the General Plan.⁷

³ San Francisco Recreation and Parks Department. 2014. *Who We Are*. Available: <http://sfrecpark.org/about/who-we-are/>>. Accessed: January 24, 2013.

⁴ San Francisco Planning Department. 2014. *San Francisco General Plan, Recreation and Open Space Element*. April. Available: <http://openspace.sfplanning.org/docs/Recreation-and-Open-Space-Element-APRIL-2014-ADOPTED.pdf>>. Accessed: May 22, 2014. This number includes SFRPD, state and federal open space land in the City and County of San Francisco.

⁵ San Francisco Recreation and Parks Department. *Park Index*. Available: <http://sfrecpark.org/destinationtype/park/>. Accessed May 23, 2014.

⁶ San Francisco Planning Department. 2014. *San Francisco General Plan, Recreation and Open Space Element*. April. Available: <http://openspace.sfplanning.org/docs/Recreation-and-Open-Space-Element-APRIL-2014-ADOPTED.pdf>>. Accessed: May 22, 2014. This number includes SFRPD, state and federal open space land in the City and County of San Francisco.

⁷ San Francisco Planning Department. 2014. *San Francisco General Plan, Recreation and Open Space Element*. April. Available: <http://openspace.sfplanning.org/docs/Recreation-and-Open-Space-Element-APRIL-2014-ADOPTED.pdf>>. Accessed: May 22, 2014. This number includes SFRPD, state and federal open space land in the City and County of San Francisco.

■ **Nearby and Adjacent Recreational Facilities**

Within the Potrero Hill District area are five children's play areas, two dog play areas, three community gardens, a recreation center, and open space. Adjacent to the Project site is the Potrero Hill Recreation Center itself, which measures a total of 9.54 acres, as shown in Figure 4.12-1, and has the Potrero Hill Recreation Center Children's Play Areas (6,223.52 sf), the Potrero Hill Recreation Center Dog Play Area (17,897.88 sf)⁸, baseball/softball/soccer fields, two tennis courts, a basketball court, picnic area, walking paths, and an indoor recreation center that includes an auditorium, stage, and gym with programming for youths, adults, and seniors. Mature trees that vary in height from approximately 10 to 30 feet exist along the perimeter of the park, with large concentrations on the eastern and northern perimeters.

The indoor recreation center and fields are open between 9:00 a.m. and 9:00 p.m. Tuesday through Friday, and on Saturday between 9:00 a.m. and 5:00 p.m. Additionally, the indoor recreation center and fields are locked and closed on Sunday and Monday. There is a gate on site restricting access to the fields. In the summer, the indoor recreation center and fields are also open on Mondays between 9:00 a.m. and 6:00 p.m. All park hours are enforced by Park Patrol.

Additionally there are three parks, McKinley Square, Jackson Playground, and the Potrero Hill Mini Park, near the Project site. McKinley Square is an approximately 2.81-acre park, accessible to the public, located approximately 0.40 mile west of the Project site, with a playground, community garden, dog play area, and open space. Jackson Playground is an approximately 4.41-acre park, accessible to the public, located approximately 0.50 mile north of the Project site, with a playground, picnic areas, tennis courts, basketball courts, and two ball fields. The Potrero Hill Mini Park is 0.22-acre and is located at Connecticut Street and 22nd Street. There are two community gardens managed by SFRPD located adjacent to the Potrero Hill Recreation Center. The Arkansas Friendship Garden (5,638.58 sf) is located at Arkansas Street and 22nd Street and the Connecticut Friendship Garden (5,903.56 sf) is located at Connecticut Street and 22nd Street.

San Francisco has a temperate climate that allows the park's tennis courts, basketball courts, baseball fields, and other amenities to be open year-round. The fields at Potrero Hill Recreation Center and Jackson Playground are booked most days from 3:00 p.m. to 7:00 p.m. During the summer, the fields are used during the day for summer camps. Jackson Playground includes night lighting allowing it to be used Monday through Friday 7:00 p.m. to 10:00 p.m. Fields at both parks are in use every Saturday. Jackson Playground is used every Sunday and the playground at the Potrero Hill Recreation Center is used occasionally on Sunday.

⁸ San Francisco Recreation and Parks Department. 2013. *Find a Destination* (Recreation and Parks Main Map). Available: <http://sfrecpark.org/parks-open-spaces/find-a-destination/>>. Accessed: January 24, 2013.



SOURCE: ICF, 2014.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.12-1: RECREATION FACILITIES IN THE PROJECT AREA

There is a wide variety of programming offered at the Potrero Hill Recreation Center. Afterschool activities are offered throughout the school year. Tot soccer, tennis, dance and art are offered year round. Junior Giants baseball teams and basketball camps operate during the summer season and Junior Warriors basketball teams operate during the winter season. Adult and senior exercise classes are offered during winter and spring. Many of these programs are highly utilized by city residents, with children's programming as the most highly utilized. In 2013, the afterschool program was at 150 percent of capacity, while much of the tot programming was at 80 percent to 105 percent capacity. Adult programming is less utilized, with most adult programming at zero to 10 percent capacity. All sessions of the Summer Basketball Camp were between 85 percent to 105 percent capacity in 2013.

West of Starr King Elementary School is an approximately 3.5-acre parcel known as Starr King Open Space. This area is accessible to the public.

■ **Park and Recreation Needs**

Under Policy 2.1 of the Recreation Element of the General Plan, the City identified the need to increase the per capita supply of public parks and open space. As part of this effort, city residents voted in favor of the 2008 Clean and Safe Neighborhood Parks Bond, which is expected to fund renovations and repairs to 12 existing parks, playgrounds, and athletic fields throughout the city.⁹ However, the Potrero Hill Recreation Center was not one of the 12 parks included as part of the 2008 Bond.

Within San Francisco, the "neighborhood service areas" concept is used to distribute SFRPD facilities and services throughout the city's neighborhoods. The service area concept is based on the distance most users are willing to walk to reach an open space or recreation facility, and varies based on the size and type of open space or recreation facility and the nature of the surrounding topography. The commonly accepted distance for pedestrian access to community services or facilities is generally a 0.5 mile (a 10-minute walk) for the general population and a 0.25 mile (a 5-minute walk) for families with children.

The city's open spaces and recreational facilities are categorized as city-serving, district-serving, and neighborhood-serving or sub-neighborhood serving, depending on their size and the facilities offered.¹⁰ City-serving open spaces vary in size from small areas with unique features to large parks and generally have a service area of a 0.5-mile radius around the park. Several large park and open space areas, including Golden Gate Park, the Lake Merced Complex, Glen Canyon Park, and John

⁹ City and County of San Francisco. 2007. *2008 Clean & Safe Neighborhood Parks Bond*. October. Available: <http://sf-recpark.org/ftp/uploadedfiles/wcm_recpark/GOBond/BondReport101207.pdf>. Accessed: May 7, 2012.

¹⁰ San Francisco Planning Department. 2010. *San Francisco General Plan, Recreation and Open Space Element*. June. Available: <http://www.sf-planning.org/ftp/General_Plan/I3_Rec_and_Open_Space.htm>. Accessed: February 25, 2014.

McLaren Park, amount to about one-half of the total SFRPD-owned acreage. In addition, smaller areas with unique attributes, such as water features or hilltop vista points, attract residents from the entire city and function as city-serving open spaces even though they are smaller in size. Unlike neighborhood facilities, city-serving parks and open spaces provide programs, activities, or recreation opportunities that serve the city as a whole. District-serving open spaces are generally larger than 10 acres and have a service area of a 0.375-mile radius around the park, while neighborhood-serving parks are generally 1 to 10 acres and have a service area of a 0.25-mile radius around the park. Sub-neighborhood-serving open spaces, often referred to as mini parks, are less than an acre and are too small to accommodate athletic facilities. The service area for sub-neighborhood parks is a 0.125-mile radius around the park.

As a whole, San Francisco is meeting its citizens' parks and recreation needs, but there are many areas that need new, improved, and additional parks and open space. San Francisco's General Plan goal is to increase open space and recreational opportunities citywide, particularly in High Needs Areas, as identified in the General Plan's Recreation and Open Space Element Neighborhood Recreation & Open Space Improvement Priority Plan (Map 9). In an effort to improve existing facilities, as stated above, the City of San Francisco passed the 2008 Clean and Safe Neighborhood Park Bond. This bond was extended by voters in November 2012. This bond focuses on improving playgrounds, pools, playfields, trails, tree planting, American with Disabilities Act (ADA) improvements, nature restoration, environmental remediation, and park development along the waterfront. Potrero Hill Recreation Center is identified in the 2012 Clean and Safe Neighborhood Park Bond as a facility that will receive funding for improvements. Upgrades funded by the bond at this facility include improvements to the natural turf playfields and the dog play area. Planning for these improvements is scheduled to begin in February 2015 and construction is scheduled to begin in April 2017 and conclude in July 2018. No additional funding has been identified for the Potrero Hill Recreation Center beyond the natural turf playfields and dog play area.

McKinley Square received funding for improvements related to native plantings and other landscaping, irrigation, and the construction of a drinking fountain, kiosk, and pathway. The improvements are anticipated to be completed by summer 2014. No improvements are currently proposed for Jackson Playground.

4.13 UTILITIES AND SERVICE SYSTEMS

4.13.1 Introduction

This section provides an overview of existing utilities and service systems for the City of San Francisco and the Project area, including water supply, wastewater service, stormwater drainage, and solid waste removal.

Several comments regarding potential impacts on utilities and service systems were received in response to the Notice of Preparation (NOP) and Notice of Intent (NOI) for the Draft EIS. The comments expressed concern that the proposed Project would result in an increase in demand for utilities that could lead to higher costs, increased greenhouse gas emissions, and reduced water quality. Comments also focused on the proposed Project's demand for energy and whether this demand could be met through the use of renewable energy sources. Issues raised in response to the NOP and NOI are addressed in the environmental analysis contained in Section 5.13, *Utilities and Service Systems*. For further information regarding the proposed Project's effect on greenhouse gas emissions and the use of renewable energy refer to Section 5.10, *Greenhouse Gas Emissions*, of this Draft EIR/EIS.

4.13.2 Existing Conditions

■ Water Supply and Demand

San Francisco Public Utilities Commission Regional Water System

According to the 2010 San Francisco Urban Water Management Plan (UWMP), which was adopted by the San Francisco Public Utilities Commission (SFPUC) on June 14, 2011, nearly 2.6 million people rely on water supplied by the SFPUC water system to meet their daily water needs, including wholesale customers in the Peninsula, South Bay, and Easy Bay communities. San Francisco customers, or "in-City" customers, include those within the City and County of San Francisco. The Regional Water System (RWS) consists of over 390 miles of pipeline, over 74 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants located outside the city (the RWS) and over 1,235 miles of pipeline, 11 reservoirs, eight storage tanks, and 22 pump stations located within the city limits. Water supplies to the in-city distribution system from the RWS are currently limited to an average annual supply of 265 million gallons per day (mgd). The SFPUC provides water to both retail (residents, businesses, and industries within the corporate boundaries of the city) and wholesale customers. The RWS draws approximately 85 percent of its water from the Upper Tuolumne River Watershed. Water is collected in the Hetch Hetchy Reservoir in Yosemite National Park, fed into an aqueduct system, and then conveyed water 167 miles by gravity, and ultimately delivered to Bay Area reservoirs and customers. The remaining water supply (approximately 15 percent) is drawn from local surface waters in the Alameda and Peninsula

watersheds.¹ However, during a drought, the water received from the Hetch Hetchy Water and Power Project can constitute over 93 percent of the total water delivered.² Table 4.13-1 summarizes the current and projected retail (in-city) water demand and Table 4.13-2 illustrates the current and projected retail water supply.

Since water records were not available, water demand for the existing development at the Project site was estimated using the demand factors identified in the *Water Demand and Wastewater Generation Technical Memorandum* (see Appendix 4.13).

As stated above, the Project site currently contains 620 public housing units³ and approximately 1,200 residents. In addition, the on-site day care and preschool contain approximately 50 students and staff. Based on this population data, the existing water demand at the Project site is approximately 0.08 mgd.⁴

Water Treatment Facilities

SFPUC's regional water system includes two treatment plants: the Sunol Valley Water Treatment Plant (SVWTP) and the Harry Tracy Water Treatment Plant (Harry Tracy WTP). The SVWTP is located in the Sunol Valley, an unincorporated part of Alameda County within SFPUC's Alameda watershed. The SVWTP has a peak capacity of 160 mgd and a sustainable capacity of 120 mgd.⁵ The treatment process at this facility includes coagulation, flocculation, sedimentation, filtration, and disinfection. The SFPUC is in the process of implementing a number of individual water supply improvement projects as part of the broader Water System Improvement Program (WSIP). The WSIP is intended to repair, replace, and seismically upgrade the RWS's aging infrastructure to ensure reliability in the future.⁶ As part of the WSIP, the SVWTP recently underwent an expansion to ensure that the facility can sustainably treat 160 mgd to a potable level and to improve the overall

¹ San Francisco Public Utilities Commission. 2011. *2010 San Francisco Urban Water Management Plan for the City and County of San Francisco*. June. p. 7.

² San Francisco Public Utilities Commission. 2011. *2010 San Francisco Urban Water Management Plan for the City and County of San Francisco*. June. p. 19.

³ This Draft EIR/EIS states throughout that there are 620 residential units currently at the Project site. Of these 620 units, 14 are used for childcare and service space and 606 are used for residential purposes. The Proposed Project would replace 606 public housing units on a one-for-one basis. The remaining 14 units would effectively be replaced by providing childcare and service space in the proposed Community Center. Thus, the Proposed Project would replace all current uses.

⁴ Existing water demand was estimated using the following equation $(1,250 \text{ people} \times 60.8 \text{ mgd})/1,000,000$. See Appendix 4.13.

⁵ San Francisco Public Utilities Commission. 2011. *2010 Urban Water Management Plan for the City and County of San Francisco*. June. p. 11.

⁶ San Francisco Public Utilities Commission. *About WSIP*. Available: <http://www.sfwater.org/index.aspx?page=115>. Accessed: June 20, 2012.

efficiency of the treatment process while improving the reliability and water quality at the treatment plant. Construction was completed in August 2013.⁷

Table 4.13-1 SFPUC Retail Water Demand (mgd)

Users, Facilities, and Entities	Projected Water Demand					
	2012 a	2015	2020	2025	2030	2035
In-City Customers						
Single-Family Residential ^b	16.1	17.9 16.7	15.5	14.8	14.4	14.3
Multi-Family Residential ^b	24.9	28.9 28.1	27.7	27.6	27.9	28.6
Non-Residential ^b	23.2	25.6 26.5	27.7	27.5	27.7	28.7
Other In-city Demands ^{d,g}	0.2	0.2	0.2	0.2	0.2	0.2
In-City Irrigation Uses	1.5	1.5	1.5	1.5	1.5	1.5
Losses ^{b,c}	6.9	5.0 5.1	5.2	5.2	5.2	5.3
<i>In-city Subtotal^e</i>	72.8	77.7 78.1	77.8	76.8	76.9	78.6
Suburban Retail Customers						
Single Family Residential ^g	0.1	0.1	0.1	0.1	0.1	0.1
Non-Residential ^g	3.7	4.3	4.3	4.3	4.3	4.3
Hetch Hetchy Water and Power Customers ^{f,g}	1.2	1.2	1.2	1.2	1.2	1.2
<i>Suburban Retail Subtotal</i>	5.0	5.6	5.6	5.6	5.6	5.6
<i>Total Retail Demand^k</i>	77.8	83.7	83.4	82.4	82.5	84.2

SOURCE: San Francisco Public Utilities Commission. 2013. 2013 Water Availability Study for the City and County of San Francisco May. Table 6, p. 17.

- a. 2012 data are based on actual billing data.
- b. 2015-2035 projections were generated using the SFPUC Retail Demand Model and include savings from passive and active conservation.
- c. Losses reported for 2012 include meter under-registration. Losses for 2015-2035 exclude meter under registration because they are included in the retail demand projections for residential and non-residential sectors. Meter under-registration losses are estimated at 2.2% of residential and 2.1% of non-residential sector demands. System losses excluding meter under-registration are estimated at 6.86% of sector demand.
- d. Builders and Contractors, Docks and Ships.
- e. Irrigation at Golden Gate Park, the Great Highway, and the San Francisco Zoo.
- f. Hetch Hetchy Water & Power Customers include Lawrence Livermore National Laboratory, Groveland Community Services District and other incidental uses.
- g. 2015-2035 projections are based on average historic consumption, which has remained relatively constant over the past 20 years.

⁷ San Francisco Public Utilities Commission. 2014. *WSIP: Projects, Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir*. Available: <http://216.119.104.145/bids/projectDetail.aspx?prj_id=244>. Accessed: January 5, 2014.

Table 4.13-2 SFPUC Retail Water Supply

<i>Current and Future Water Supply Sources</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>
Existing Supply Sources					
RWS Watersheds—Retail Allocation	81.0	81.0 ^a	81.0 ^a	81.0 ^a	81.0 ^a
Suburban Groundwater and Subsurface Diversions: ^a	0.7	0.7	0.7	0.7	0.7
North Westside Groundwater Basin ^b	1.5	1.5	1.5	1.5	1.5
Recycled Water – Harding Park and Sharp Park	0.3	0.3	0.3	0.3	0.3
<i>Existing Supplies Subtotal</i>	<i>83.5</i>	<i>83.5</i>	<i>83.5</i>	<i>83.5</i>	<i>83.5</i>
Future Water Supply Sources ^c					
Future North Westside Groundwater Basin Expansion ^b	0.0	2.8	2.8	2.8	2.8
Future Recycled Water Projects	0.0	2.0	4.0	4.0	4.0
<i>Future Supply Subtotal</i>	<i>0.0</i>	<i>4.8</i>	<i>6.8</i>	<i>6.8</i>	<i>6.8</i>
<i>Total Supply</i>	<i>83.5</i>	<i>88.3</i>	<i>90.3</i>	<i>90.3</i>	<i>90.3</i>

SOURCE: San Francisco Public Utilities Commission. 2013. 2013 Water Availability Study for the City and County of San Francisco May. Table 6, p. 13.

- a. These sources consist of groundwater use at Castlewood (not connected to RWS) of approximately 0.4 mgd, and subsurface diversions to Sunol Golf of approximately 0.3 mgd taken from the Sunol Infiltration Gallery
- b. The North Westside Groundwater Basin is currently used for irrigation. In-City groundwater use will be expanded for potable use with the San Francisco Groundwater Supply Project. Approximately 1.2 mgd of existing groundwater use will be converted to potable use (for a total of 4.0 mgd) once the Westside Recycled Water project is completed as a substitute irrigation water supply
- c. The implementation of proposed future supply sources is contingent on completion of necessary project level environmental review and project approval. If these supplies are not available as planned, and if retail demand exceeds the available water supply, the Water Supply Agreement allows the SFPUC to import additional water from the RWS, with mitigation implemented by the SFPUC and potential environmental surcharges if RWS deliveries exceed the 265 mgd interim supply limitation. (Total RWS deliveries in FY11/12 were 219.4 mgd.)

The Harry Tracy WTP was built in 1971 and expanded in 1988 and 1990. Located in unincorporated San Mateo County near the San Bruno and Millbrae city limits, this plant provides ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chlorination for water collected in all of the Peninsula reservoirs. The Harry Tracy WTP has a peak treatment capacity of 180 mgd and a sustainable capacity of 120 mgd. As part of the WSIP, the Harry Tracy WTP Long Term Improvement Project is underway to improve delivery reliability and provide seismic upgrades to achieve a sustainable capacity of 140 mgd.⁸ These long-term improvements are currently 76 percent complete and anticipated to be completed by February 2015.

In May 2009, the SFPUC began construction on a third water treatment plant, the Tesla Treatment Facility, located in unincorporated San Joaquin Valley. The facility passed all testing and reached final completion in November 2012. The next phase of the project, which includes construction and renovation of protective facilities at the site, was completed in 2013. The Tesla Treatment Facility includes an ultraviolet (UV) water disinfection facility and can treat up to 315 mgd per day. Completion of the improvements to these three water treatment facilities would ensure a sustainable water treatment capacity of 615 mgd by 2015.

⁸ San Francisco Public Utilities Commission. 2012. *WSIP: Projects, HTWTP Long-Term Improvements*. <http://216.119.104.145/bids/projectDetail.aspx?prj_id=145>. Accessed February 16, 2012.

The City maintains an Auxiliary Water Supply System (AWSS) for fire protection purposes only. One AWSS underground cistern is located at the intersection of Arkansas Street and 20th Street, which is one block north of the Project site. Cisterns in this area of the city are not connected to a distribution system, so water must be pumped from them using engine pumpers.⁹

■ **Wastewater**

The SFPUC maintains and operates a combined sewer collection system consisting of about 976 miles of underground pipes that serves most of San Francisco, including the Project site. This system collects stormwater runoff and wastewater flows in the same network of pipes. It conveys flows to facilities where they are treated prior to discharge through outfalls into the Bay or Pacific Ocean. Discharges are regulated under National Pollutant Discharge Elimination System (NPDES) permits from the California Regional Water Quality Control Board, San Francisco Bay Region.

The SFPUC maintains and operates three wastewater treatment facilities for the City and County of San Francisco: the Oceanside Water Pollution Control Plant (OSP), the Southeast Water Pollution Control Plant (SEP), and the North Point Wet-Weather Facility.¹⁰ These wastewater facilities can collect and treat more than 500 mgd of combined wastewater and stormwater runoff.¹¹

Currently, there are no stormwater treatment facilities on the Project site. Approximately 92 percent of the City, including the Project site, is served by a combined wastewater and stormwater collection, conveyance, and treatment system.¹² The city is divided into an eastern and western basin. The Project site lies in the eastern basin, where average dry weather flows of 63 mgd are directed to the SEP located on Phelps Street, south of Islais Creek on the eastern waterfront. All stormwater that originates on the east side of San Francisco is conveyed to the SEP via two wet-weather pump stations, the Sunnydale Pump Station and the Bruce Flynn Pump Station. The SEP was designed to treat all dry-weather flows and up to 250 mgd of wet-weather flows in the Bayside Watershed. Treated wet weather discharges of up to 250 mgd flow through the Pier 80 outfall or through the Quint Street outfall to Islais Creek. Only wastewater treated to a secondary level is discharged at the Quint Street outfall. During wet weather, the SEP wet-weather facilities are engaged to provide primary treatment to an additional 100 mgd of combined wastewater and

⁹ Metcalf & Eddy, AECOM. 2009. *Final Report: Auxiliary Water Supply System (AWSS) Study*. Prepared for Capital Planning Committee, City and County of San Francisco. January. Available: <http://www.sfgov2.org/ftp/uploadedfiles/cpp/documents/AWSS%20Report%20Final%202009-01-23.pdf>. Accessed: January 5, 2014.

¹⁰ San Francisco Public Utilities Commission. Available: <file:///C:/Users/31146/Downloads/SFPUC-%23612792v.PDF>. Accessed: March 1, 2014.

¹¹ San Francisco Public Utilities Commission. <http://sfwater.org/index.aspx?page=677>. Accessed: March 1, 2014.

¹² San Francisco Public Utilities Commission. 2010. *Wastewater Enterprise, Sewer System Improvement Program Report*. August. San Francisco, CA.

stormwater flow, beyond the dry-weather capacity. At full capacity, the SEP provides primary treatment to all flows up to 250 mgd and secondary treatment to a maximum flow rate of 150 mgd.¹³

Up to an additional 100 mgd of wet weather flows receive primary treatment plus disinfection at the North Point Wet Weather Facility (NPWWF), located on the north side of the City at 111 Bay Street, which operates only during wet weather. Treated effluent from this facility is discharged through four deep water outfalls, approximately 800 feet from the Bay shore. 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 Bay shore.¹⁴

The combined sewer system also includes the Bayside Wet Weather Facilities (BWWFs), which consist of interconnected large underground rectangular tanks and tunnels with a series of baffles and weirs that are designed to remove settleable solids and floatables. During dry weather, the BWWFs transport combined stormwater and wastewater to the SEP. During wet weather, the underground transport tunnels provide a total storage capacity of approximately 193 million gallons, while pumps continue to transfer combined wastewater and stormwater to the SEP. When the combined capacity of the SEP and the NPWWF is exceeded, the BWWFs retain stormwater flows for later treatment. The tanks allow floatable and settleable solid materials to be removed, similar to primary treatment processes. The materials retained in the storage and transport boxes are flushed to the treatment plants after storms.

In the event that the capacities of the SEP, the NPWWF, the BWWFs, and storage structures are exceeded, the combined stormwater and sewage, after receiving the equivalent of wet weather primary treatment in the transport structures/boxes, is discharged into San Francisco Bay through any one of the 29 shoreline combined sewer overflow (CSO) structures.¹⁵ During larger storm events, transport storage structures temporarily store wastewater that exceeds the treatment capacity of the SEP. When the SEP treatment capacity and the available storage within these storage facilities are exceeded, combined untreated sewer discharges into the Bay can occur.

The SFPUC is in the process of developing a long-term Sewer System Improvement Program (SSIP) to address the entire wastewater system citywide. One component of this program will improve the SEP, the facility that treats wastewater from the Project site before it gets discharged into the San Francisco Bay, through operational renovations and seismic upgrades to ensure reliability of the sewer system. In a parallel effort to address more immediate wastewater needs, the SFPUC in 2005

¹³ San Francisco Public Utilities Commission. 2010. *Wastewater Enterprise, Sewer System Improvement Program Report* August. San Francisco, CA.

¹⁴ San Francisco Public Utilities Commission 2010. *Sewer System Improvement Program Report: Draft Report for SFPUC Commission Review*. August. Prepared by Wastewater Enterprise Staff. Available: <<http://sfwater.org/modules/showdocument.aspx?documentid=984>>. Accessed January 5, 2014.

¹⁵ This level of treatment meets the minimum treatment specified by the USEPA *Combined Sewer Overflow Control Policy* (CSO Policy) I50 FR 18688, April 11, 1994. Available: <<http://www.epa.gov/npdes/pubs/owm0111.pdf>>. Accessed January 5, 2014.

initiated a capital improvement program (CIP) to, among other things, reduce the potential for on-street flooding during heavy rains that can occur. The original CIP had 36 projects and, over time, additional work was identified and funded through supplemental appropriations. As of late 2013, the Wastewater CIP had 72 projects, \$400 million in approved budget, and an anticipated completion date of 2016.¹⁶

In July 2005, the SFPUC began imposing a new Wastewater Capacity Charge pursuant to SFPUC Resolution No. 05-0045. This Wastewater Capacity Charge is applicable to residential, non-residential and mixed-use types of construction that place new or additional demands on the system. All funds raised through the capacity charge will be directly used to offset the cost of future wastewater capital improvement projects and repairs.

Water records for the Potrero Terrace and Potrero Annex are not available. Thus, average wastewater discharge for the Project site has been estimated using the generation factors identified in the *Water Demand and Wastewater Generation Technical Memorandum* (see Appendix 4.13).

Currently, there are 620 public housing units and approximately 1,200 residents at the Project site. There is also a day care and preschool with a total of 50 students and staff contained within one of the residential buildings. Based on this population, existing wastewater discharge at the Project site is approximately 0.07 mgd.¹⁷ Approximately 90 percent of water supplied to a residential property is discharged into the sewer system.¹⁸

■ **Solid Waste**

Recology provides collection, recycling, compost, and disposal services for the Project site. San Francisco operating companies include:

- Recology Sunset Scavenger—Provides collection services in the residential districts of San Francisco;
- Recology Golden Gate—Provides collection services in the Financial District, North Beach, South of Market, and the Marina; and
- Recology San Francisco—Operates the transfer station and recycling complex at 501 Tunnel Avenue, and Recycle Central on Pier 96.¹⁹

The Project site is currently served by the Recology transfer station in San Francisco and the Altamont landfill in Alameda. San Francisco uses a three-cart collection program: residential and

¹⁶ San Francisco Public Utilities Commission. 2014. *Wastewater Enterprise Capital Improvement Program, Quarterly Report, 2nd Quarter, Fiscal Year 2013-2014*. February 18, 2014. Available:

<<http://www.sfwater.org/modules/showdocument.aspx?documentid=5351>>. Accessed: May 22, 2014.

¹⁷ Wastewater discharge is 90 percent of ($[1,250 \text{ people} * 60.8 \text{ gpcd}] / 1,000,000$). See Appendix 4.13.

¹⁸ Betsey Eagon, San Francisco Public Utilities Commission—e-mail to Atkins. April 26, 2011.

¹⁹ Recology. 2011. Homepage. Available: <<http://sunsetscavenger.com/index.php>>. Accessed: May 4, 2011.

business customers sort solid waste into recyclables, compostable items, such as food scraps and yard trimmings, and garbage.

All materials are taken to the San Francisco Solid Waste Transfer and Recycling Center, located on Tunnel Avenue 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 to the landfill. The total demand on the recycling facilities and transfer station is approximately 3,500 tons per day.²⁰

San Francisco has created the first large-scale urban program for collection of compostable materials in the country. Residents, restaurants and other businesses send food scraps and other compostable material to Recology's Jepson-Prairie composting facility, located in Solano County or the Recology Grover composting facility in Stanislaus County.²¹ Food scraps, plant trimmings, soiled paper, and other compostables are turned into a nutrient-rich soil amendment, or compost. Recyclable materials are sent to Recycle Central, located at Pier 96 on San Francisco's Southern waterfront, where they are separated into commodities and sold to manufacturers that turn the materials into new products.

The City of San Francisco estimates that it diverted 80 percent of its waste from landfills in 2011.²² The City's per resident disposal target rate is 6.6 pounds per person per day (PPD), and its per employee disposal target rate is 10.6 PPD. In 2012, which is the most recent date for which data are available, the measured disposal rate was 2.9 PPD for residents and 4.2 PPD for employees, thereby meeting the City's target rates.²³

The portion of the City's waste that is not composted or recycled is disposed of in the Altamont Landfill. The Altamont Landfill is a regional landfill that handles residential, commercial, and construction waste. It has a permitted maximum disposal of about 11,500 tons per day and received about 1.06 million tons of waste in 2009.²⁴ In 2007, the waste contributed by San Francisco (approximately 628,914 tons) represented approximately 49 percent of the total volume of waste

²⁰ John Glaub, Recology — e-mail to Atkins, March 22, 2011.

²¹ John Glaub, Recology — e-mail to Atkins, May 6, 2011.

²² San Francisco Office of the Mayor. 2012. *Mayor Lee Announces San Francisco Reaches 80 Percent Landfill Waste Diversion, Leads All Cities in North America*, Press Release: October 5. Available: <<http://www.sfenvironment.org/news/press-release/mayor-lee-announces-san-francisco-reaches-80-percent-landfill-waste-diversion-leads-all-cities-in-north-america>>. Accessed: January 5, 2014.

²³ California Department of Resources Recycling and Recovery (CalRecycle). *Jurisdiction Diversion / Disposal Rate Summary*. Available: <<http://www.calrecycle.ca.gov/LGCentral/Reports/jurisdiction/diversiondisposal.aspx>>. Accessed: January 5, 2014. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2010.0515E.

²⁴ California Integrated Waste Management Board, Active Landfill Profiles, Altamont Landfill. <<http://www.calrecycle.ca.gov/Profiles/Facility/Landfill/LFProfile2.asp?COID=3&FACID=01-AA-0009>>, Accessed: May 27, 2010. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2010.0515E.

received at this facility. The remaining permitted capacity of the landfill is about 45.7 million cubic yards.²⁵ With this capacity, the landfill can operate until 2025.²⁶

In 1988, San Francisco contracted for the disposal of 15 million tons of solid waste at the Altamont Landfill. Through August 1, 2009, the City has used approximately 12.5 million tons of this contract capacity. The City's contract with the Altamont Landfill expires in 2015.

Hazardous waste, including household hazardous waste, is handled separately from other solid waste. Recology operates a facility at the San Francisco Dump (transfer station) at 501 Tunnel Avenue for people to safely dispose of the hazardous waste generated from their homes.²⁷

Construction and demolition (C&D) debris in the city must be transported by a registered transporter to a registered facility that can process mixed C&D debris pursuant to the City and County of San Francisco C&D Ordinance. The Ordinance requires that at least 65 percent of C&D debris from a site go to a registered C&D recycling facility.²⁸

²⁵ California Department of Resources Recycling and Recovery (CalRecycle). 2014. *Facility/Site Summary Details: Altamont Landfill & Resources Recovery (01-AA-009)*. Available:

<<http://www.calrecycle.ca.gov/SWFacilities/Directory/01-AA-0009/Detail/>>. Accessed: February 27, 2014.

²⁶ California Department of Resources Recycling and Recovery (CalRecycle). 2014. *Facility/Site Summary Details: Altamont Landfill & Resources Recovery (01-AA-009)*. Available:

<<http://www.calrecycle.ca.gov/SWFacilities/Directory/01-AA-0009/Detail/>>. Accessed: February 27, 2014.

²⁷ Recology SF. 2011. *The San Francisco Dump (Transfer Station)*. Available:

<<http://sunsetscavenger.com/sfDump.htm>>. Accessed: May 5, 2011.

²⁸ SF Environment. 2012. *City and County of San Francisco Construction and Demolition Debris Recovery Program Ordinance No. 27-06*. Available:

<http://sfenvironment.org/sites/default/files/fliers/files/cd_information_rev_01.03.12.pdf>. Accessed: June 20, 2012.

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4.14 PUBLIC SERVICES

4.14.1 Introduction

This section discusses existing police protection; fire protection and emergency medical services; public school facilities; and public libraries serving the city and Project site park and recreational facilities are discussed in Section 4.12 and Section 5.12, *Recreation*, of this Draft EIR/EIS. Several comments regarding public services were received in response to the Notice of Preparation (NOP) and Notice of Intent (NOI). Comments identified potential impacts to public services such as police, fire, health care, and schools that could result from the increase in resident population at the Project site. The Proposed Project's effect on public services is addressed in Section 5.14, *Public Services*.

4.14.2 Existing Conditions

■ Police

The San Francisco Police Department (SFPD) provides police protection services in the City and County of San Francisco (CCSF). The SFPD is headquartered at 850 Bryant Street. The SFPD is divided into 4 bureaus: Administration, Airport, Field Operations, and Investigations. The SFPD divides the city into two areas—the Metro Division and the Golden Gate Division—each of which is divided into five separate districts (10 in total) in order to efficiently serve the city's residents.

The Project site is located within the Bayview District, which is a part of the Golden Gate Division. This division covers one of the largest areas and includes the southeastern part of the city, extending along the eastern edge of McClaren Park (Cambridge Street) to the Bay and south from Channel Street to the San Mateo County line. The area includes Candlestick Park (the existing San Francisco 49ers stadium) and is the focus of a major redevelopment effort at the Bayview and Hunters Point areas.¹

The SFPD and the San Francisco Housing Authority have a Memorandum of Understanding (MOU) agreement to provide supplemental police services within the Bayview District. As part of the MOU, the SFPD has agreed to provide a police commander to oversee all activities associated with each public housing property. All information from the SFPD's precincts is channeled through the commander and passed on to the San Francisco Housing Authority staff.²

Four officers are assigned to the Potrero Housing Development, which includes the Project site, with at least two officers present per day. Under the MOU, the Housing Authority provides a substation

¹ San Francisco Police Department. 2011. Bayview Station. Available: <<http://sf-police.org/index.aspx?page=798>>. Accessed: July 18, 2011.

² U.S. Department of Housing and Urban Development, Office of Public Housing. 2012. *San Francisco Housing Authority 2012-2013 Agency Plan*. May. San Francisco, CA.

to the assigned officers at 1090 Connecticut Street. It should be noted that this substation is not always staffed by officers, but is near the Housing Authority offices. The substation serves as a place for local residents to report problems and for officers to meet with residents, help children with homework, take breaks, and complete paperwork. The substation aids in the joint effort of the SFPD and Housing Authority to keep residents safe.^{3,4}

As of 2008 (the latest data available), there were 2,277 sworn employees in the SFPD.⁵ Of the 2,277 sworn employees, 1,498 employees are in the Field Operations Bureau.⁶ The city's population in 2010 consisted of 805,235 residents.⁷ Therefore, the ratio of officers to population is 2.83 sworn officers per 1,000 residents. Although the SFPD does not have a sworn officer to resident ratio goal, the existing ratio is used as a baseline to compare against in Section 5.14, *Public Services*.

Calls for services are categorized as Priority A, B, and C, with Priority A calls being the most urgent and Priority C calls taking the lowest priority. The SFPD's response time goals are 4 minutes for Priority A calls, 7 minutes and 30 seconds for Priority B calls, and 10 minutes for Priority C calls. In 2011, the average response time for highest priority calls, such as reports of homicide, robbery, or crimes involving weapons, was 1 minute and 17 seconds. The average response time for Priority A and B calls was 6 minutes and 33 seconds and 10 minutes and 18 seconds, respectively.⁸

■ **Fire and Emergency Medical Services**

The San Francisco Fire Department (SFFD) is responsible for protecting life and property throughout San Francisco from fires, natural disasters, and hazardous materials incidents and to save lives by providing emergency medical services. The SFFD also provides unified emergency medical services in the city, including basic life support and advanced life support services. In addition, several privately operated ambulance companies are authorized to provide basic and advanced life support services.⁹

³ David Hamilton, Housing Sergeant, San Francisco Police Department—telephone communication with Atkins (September 22, 2011).

⁴ Charlie Orkes, Operations Bureau, Golden Gate Division, San Francisco Police Department—email communication with Atkins (December 7, 2012).

⁵ San Francisco Police Department. 2008. *District Station Boundaries Analysis*. May. p. 45. Available: <<http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683>>. Accessed: January 6, 2012.

⁶ San Francisco Police Department. 2008. *Organizational Assessment of the San Francisco Police Department: A Technical Report*, Final Report. December. Available: <<http://sf-police.org/Modules/ShowDocument.aspx?documentid=14694>>. Accessed: November 1, 2012.

⁷ U.S. Census Bureau. 2010. *American Fact Finder, Table GCT-PL2: Population and Housing Occupancy Status: 2010-County – Census Tract 2010 Census Redistricting Table (Public Law 94-171) Summary File, County of San Francisco*. Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed April 18, 2011.

⁸ San Francisco Police Department, Jim Dimodica—electronic communication with Atkins (December 21, 2011).

⁹ San Francisco Fire Department. 2012. *Mission Statement*. <<http://www.sf-fire.org/>>. Accessed November 1, 2012.

Water supply for fire suppression in San Francisco is provided mainly from the potable supply, but is augmented by an auxiliary water supply system (AWSS) more commonly known as the San Francisco Fire Department High-Pressure System. This system consists of mains and 1,889 high-pressure fire hydrants, independent of the domestic water supply, built solely for the purpose of firefighting. The system is supplied with fresh water, by gravity, from a reservoir and two tanks located at high elevations in the city.¹⁰

Resources include 42 engine companies, 19 truck companies, ambulances, two heavy rescue squads, two fireboats, and multiple special-purpose units. According to the San Francisco Annual Report FY 2005/06 (the most recent report available), the SFFD is made up of 1,675 uniformed and 66 civilian personnel at 44 stations citywide.¹¹ The city's population in 2010 consisted of 805,235 residents.¹² Therefore, the ratio of uniformed fire personnel to residents is approximately 2.08 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 in Section 5.14, *Public Services*.

Fire suppression companies are organized into three divisions, including the Airport Division, Division 2, and Division 3, which are further divided into nine battalions. The Airport Division is composed of three firefighting companies located at the San Francisco International Airport. Division 2 is divided into four battalions, and Division 3 is divided into five battalions.¹³

The Project site is located within Division 3, which includes the South of Market area, extending through the southwestern boundaries and up to the southern border of the city. Division 3 also includes San Francisco International Airport, Treasure Island/Yerba Buena Island, the Hunter's Point Naval Shipyard, public transportation maintenance and repair yards, and an extended area of port facilities.¹⁴

The nearest fire station to the Project site is Station 37, which is a single engine company located at 798 Wisconsin Street (approximately 0.20 miles to the north) under Battalion 10. Currently, there are no plans for expansion of facilities, staff, or equipment inventory around the Project site. At a station that houses a single engine company, on-duty staff at any one time consists of one officer (either a lieutenant or a captain on any given day), two firefighters (who are also emergency medical technicians [EMT]), and a third member who may be either a firefighter-paramedic or a firefighter-

¹⁰ San Francisco Fire Department. 2012. *Water Supply Systems*. <<http://www.sf-fire.org/index.aspx?page=1003>>. Accessed: November 1, 2012.

¹¹ San Francisco Fire Department. 2006. *FY 2005–2006 Annual Report*. p. 8. Available: <<http://www.sf-fire.org/Modules/ShowDocument.aspx?documentid=1142>>. Accessed: June 7, 2012.

¹² U.S. Census Bureau. *American Fact Finder, Table GCT-PL2 (Population and Housing Occupancy Status: 2010—County—Census Tract), 2010 Census Redistricting Table (Public Law 94-171) Summary File, County of San Francisco*. Available: <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed: April 18, 2011.

¹³ San Francisco Fire Department. 2014. *Fire Station Locations*. <<http://www.sf-fire.org/index.aspx?page=176#divisions>>. Accessed: March 2, 2014.

¹⁴ San Francisco Fire Department. 2012. *About SFFD Operations*. Available: <<http://www.sf-fire.org/index.aspx?page=164>>. Accessed: November 1, 2012.

EMT. If the station houses a truck company in addition to the engine, the crew of the truck consists of one officer (either a lieutenant or a captain), and four firefighters, (all of whom are also EMTs). Two stations in the city, one at 19th and Folsom and another at Third and Howard, also house Rescue Squads, comprised of an officer and three firefighters, all of whom are EMTs.¹⁵

During calendar year 2011, the SFFD received a total of 22,915 non-emergency calls and 78,158 emergency calls. The average citywide response time (dispatch to on-scene) was 8 minutes and 34 seconds for non-emergency calls and 3 minutes and 25 seconds for emergency calls. In addition, the SFFD has a dynamically deployed ambulance system. Ambulances are staffed to meet demand in the city and the total number of ambulances varies throughout the day. The goal for transport units for a code 3 (emergency), which is a potentially life-threatening incident, is to arrive on scene within 5 minutes of dispatch 90 percent of the time. This goal complies with the National Fire Protection Association (NFPA) 1710 Standard. As noted above, the SFFD's average emergency response time was 3 minutes and 25 seconds and the 90th percentile average was 4 minutes and 47 seconds. On average, the citywide transport units slightly exceed the desired performance standard by approximately 13 seconds.¹⁶

■ Schools

The San Francisco Unified School District (SFUSD) oversees the public school system in San Francisco (K–12). The SFUSD is comprised of 34 child development centers, 64 elementary schools (K–5), 14 middle schools, 18 high schools, 11 Alternative Grade Spans, and three charter schools.¹⁷ Based on data for the 2013/2014 school year, there are approximately 58,394 students currently attending public schools in San Francisco.¹⁸ Table 4.14-1 shows the existing classroom capacity, enrollment for the SFUSD in 2013/2014, and the remaining capacity by grade level.

¹⁵ Barbara Schultheis, Fire Marshall, San Francisco Fire Department—email to Atkins (March 28, 2011).

¹⁶ Jesus Mora, Information Services Project Director, SFFD—email to Atkins (January 6, 2012).

¹⁷ San Francisco Unified School District. 2008. *San Francisco Unified School District Capital Plan FY 2009–2018, Appendix*. April. San Francisco, CA.

¹⁸ Public school attendance based on: California Department of Education. 2012. *2013–2014 District Enrollment by Grade, San Francisco Unified, Educational Demographics Unit, DataQuest System*. Available: <<http://data1.cde.ca.gov/dataquest>>. Accessed: June 4, 2014.

Table 4.14-1 Existing Classroom Capacity and Enrollment, SFUSD, 2013/2014

<i>Type of School</i>	<i>Number of Schools^a</i>	<i>Capacity</i>	<i>2013/2014 Enrollment^b</i>	<i>Remaining Capacity</i>
Elementary School (K–5)	64	29,300	27,573	1,727
Middle School (6–8)	14	11,700	11,766	-66
High School (9–12)	18	17,575	19,055	-1,480
<i>Total</i>	93	58,575	58,394	181

SOURCES:

- San Francisco Unified School District. 2008. *San Francisco Unified School District Capital Plan FY 2009–2018, Appendix*. April. San Francisco, CA.
- California Department of Education. 2014. *Educational Demographics Unit, DataQuest System: 2013–2014 District Enrollment*. San Francisco, CA.

SFUSD is the primary public school provider in the city, accommodating approximately 98 percent of the total public school enrollment. Additional public school facilities include court-sponsored facilities (correctional institutions, court ward facilities, etc.) and public charter schools.

As shown in Table 4.14-1, there is capacity for approximately 58,575 students in existing SFUSD elementary, middle, and high schools. Although neighborhoods with a high population of school-age children generate a proportionally high level of demand for nearby schools, SFUSD assigns students to schools based on a lottery system. This system ensures that student enrollment is distributed to facilities that have sufficient capacity to adequately serve the educational needs of students.

With enrollment generally declining in the District (except for high schools), SFUSD has been closing schools. The SFUSD's capital facilities program has focused on replacing older schools and modernizing other facilities. The San Francisco Unified School District Capital Plan identifies a range of physical improvements necessary to modernize existing facilities, such as providing access compliant with the Americans with Disabilities Act (ADA), upgrading science and computer labs, expanding arts facilities, and other improvements. In addition, the SFUSD has a backlog of deferred maintenance needs.¹⁹

The Project site is served by, or within the vicinity of, Starr King Elementary School, located at 1215 Carolina Street (approximately 0.05 mile to the west); Daniel Webster Elementary School, located at 465 Missouri Street (approximately 0.20 mile to the north); and International Studies Academy (serving 6th through 12th graders), located at 655 De Haro Street (approximately 0.35 mile to the north).²⁰ As shown in Table 4.14-2, all three schools were within capacity during the 2013/14 school year. The SFUSD school that formerly occupied the southeast corner of the Connecticut Street/25th Street intersection is closed, and the site only consists of a basketball court.

¹⁹ San Francisco Unified School District. 2009. *FY 2010–2019 Capital Plan*. Available: <
[http://sfgov2.org/ftp/uploadedfiles/cpp/capital_plan/Capital%20Plan\(1\).pdf](http://sfgov2.org/ftp/uploadedfiles/cpp/capital_plan/Capital%20Plan(1).pdf)>. Accessed March 2, 2014.

²⁰ Nancy Waymack, Executive Director of Policy and Operations, SFUSD—email correspondence with Atkins (May 27, 2011).

Table 4.14-2 Existing Classroom Capacity and Enrollment, Schools within the Vicinity of the Project Site, 2013/14

<i>Type of School</i>	<i>Capacity^a</i>	<i>2013/14 Enrollment^b</i>	<i>Remaining Capacity</i>
Starr King Elementary (K–5)	625	352	273
Daniel Webster Elementary (K–5)	575	281	294
International Studies Academy (6–12)	825	263	562

SOURCE: California Department of Education. 2014a. *Educational Demographics Unit, DataQuest System: 2013–2014 Enrollment by Grade 2013-14*. San Francisco, CA.

- a. Building occupancy Load is estimated at 25 students per classroom and includes bungalows where applicable.
- b. Enrollments do not include preschool classrooms or spaces used for non-instructional purposes.
- c. Number of students per teacher.

■ Libraries

The San Francisco Public Library (SFPL) operates the Main Library at San Francisco’s Civic Center and 28 neighborhood branches distributed throughout the city, providing information in books, other print and non-print formats, or electronic form. The SFPL is dedicated to providing free and equal access to information, knowledge, independent learning, and the joys of reading for San Francisco.²¹ During the 2013/2014 fiscal year, the SFPL collection size²² was 3,478,315 items with 434,267 total patrons.²³ Community-based branch libraries, as well as the Main Library, provide reading rooms, book lending, information services, access to technology, and library-sponsored public programs. Most branches offer an event almost every day, often for preschool and elementary schoolchildren, such as story time, crafts, and videos. Programs for youth include reading and computer-oriented clubs.

There are six libraries within an approximately 2-mile radius of the Project site: the Potrero Branch, located at 1616 20th Street (approximately 0.4 mile to the north); Mission Branch, located at 300 Bartlett Street (approximately 1.15 miles to the west); Bernal Heights Branch, located at 500 Cortland Avenue (approximately 1.35 miles to the southwest); the Main Library, located at 100 Larkin Street (approximately 1.80 miles to the northwest); and new branches in Mission Bay located at 960 4th Street (approximately 1.20 miles to the north) and Bayview located at 5075 3rd Street (approximately 1.40 miles to the south). The Potrero Branch Library is the only library located in the immediate vicinity of the Project site. The Potrero Branch was significantly renovated and reopened to the public in 2010.²⁴ In addition, operating hours were expanded to 6 days per week when it reopened in 2010. This branch offers limited quantities of Children’s Spanish and Chinese language collections.

²¹ San Francisco Public Library. 2014. *Mission Statement*. Available: <<http://sfpl.org/index.php?pg=2000002201>>. Accessed: January 3, 2014.

²² Includes books, CDs, DVDs, sheet music, bound periodical volumes, government documents, and software.

²³ San Francisco Public Library. 2013. *Statistics System-Wide, FY 2013–2014*. Accessed: June 12, 2014. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

²⁴ Jill Bourne, Deputy City Librarian—e-mail to Atkins (March 24, 2011).

Through a generous grant from the Eastern Neighborhood Public Benefit Fund, Potrero Branch is partnering with the Potrero Hill Archives Project and the San Francisco History Center to digitize the Potrero Hill Archives Project collection. The collection was started in 1986 to record oral histories of Potrero Hill residents and gather old photographs of the neighborhood.²⁵ The Potrero Branch has a collection size of approximately 30,171 items and received approximately 40,041 library visits in fiscal year 2013/2014.²⁶

Library Improvement Program

The Branch Library Improvement Program (BLIP) was launched as a result of 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. The BLIP is intended to provide the public with seismically safe, accessible, technologically updated, and code-compliant City-owned branch libraries in every neighborhood.²⁷ The SFPL has implemented a number of interim programs to serve the public while branches are closed for renovation or replacement. These include increasing hours at nearby branches, holding programs at neighborhood schools and community centers, and offering bookmobile services.

²⁵ San Francisco Public Library. *Potrero Library Collections*. Available: <<http://sfpl.org/index.php?pg=0100002501>>. Accessed November 1, 2012.

²⁶ San Francisco Public Library. 2014a. *Statistics by Location, FY 2031-2014*. Available: <<http://sfpl.org/pdf/about/administration/statistics-reports/statisticsbylocation.pdf>>. Accessed: June 4, 2014.

²⁷ Francisco Public Library. 2011. *Branch Library Improvement Program. Frequently Asked Questions*. Available: <<http://sfpl.org/pdf/blip/blipfaq.pdf>>. Accessed: April 15, 2011.

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4.15 BIOLOGICAL RESOURCES

4.15.1 Introduction

This section of this Draft EIR/EIS discusses the existing conditions with respect to biological resources associated with the approximately 39-acre area being considered for development of the Proposed Project.

Several comments were submitted during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods. Specifically, concerns were raised regarding tree removal, impacts to nesting birds and plant species, interference with wildlife corridors and movement, and the loss of open space. These and other issues are addressed in Section 5.15, *Biological Resources*, which includes a complete analysis of the potential environmental effects of the Proposed Project on biological resources.

Primary information and data consulted in preparation of this section include the following sources:

- Biological Resources Surveys and Reports
 - > General Biological Survey performed by Atkins on March 3, 2011
 - > Tree Inventory Survey performed by GLS Landscape/Architecture on June 23, 2010¹
- Databases
 - > California Department of Fish and Wildlife² (CDFW) California Natural Diversity Database (CNDDDB)³
 - > California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants⁴
 - > Consortium of California Herbaria⁵

¹ GLS Landscape/Architecture. 2010. *Tree Disclosure Submittal for Rebuild Potrero*. June 23. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

² Formerly known as the California Department of Fish and Game.

³ California Natural Diversity Database. 2013. Results of January 16, 2013, Records Search of Sensitive Natural Communities and Special-Status Plants and Wildlife Reported within the San Francisco North and San Francisco South, California U.S. Geological Survey (USGS) 7.5" Topographic Quadrangles, Rarefind Version 3.1.0, Commercial Version (December 1, 2012), Wildlife & Habitat Data Analysis Branch, Department of Fish and Wildlife, Sacramento, CA.

⁴ California Native Plant Society. 2013. Results of January 16, 2013, Records Search of Rare and Endangered Plants Reported within the San Francisco North and San Francisco South, California USGS 7.5" Topographic Quadrangles, Inventory of Rare and Endangered Plants (online edition, v8-01a), California Native Plant Society, Sacramento, CA.

⁵ Consortium of California Herbaria. 2013. Results of January 16, 2013, Records Search of *Erysimum franciscanum*, *Fritillaria liliacea*, *Grindelia hirsutula* var. *maritime*, *Hesperolinon congestum*, *Pentachaeta bellidiflora*, *Sanicula maritime*, *Stebbinsoseris decipiens*, and *Triphysaria floribunda*; data provided by the participants of the Consortium of California Herbaria. Available: <<http://ucjeps.berkeley.edu>>.

- > U.S. Fish and Wildlife Service (USFWS) Species Lists⁶
- > USFWS Critical Habitat Portal⁷
- > USFWS National Wetlands Inventory Wetlands Mapper⁸
- Literature Review
 - > San Francisco Municipal Code^{9,10}
 - > San Francisco Urban Bird Refuge Poster¹¹

4.15.2 Existing Conditions

A general biological survey was conducted by qualified biologist at the Project site on March 3, 2011. The purpose of the field survey was to inventory existing conditions with respect to biological resources. The survey methodology generally included walking through the pedestrian transects throughout each land use and habitat type that occurs on the Project site. The survey included identification of existing vegetation communities; qualification of existing habitats for their potential to support special-status plant and wildlife species, including a thorough assessment of the site to determine the presence or absence of suitable habitat and a search for potential nest structures; confirmation of the presence or absence of jurisdictional waters and wetlands; and documentation of all plant and wildlife species observed or otherwise detected. The March 3, 2011, survey was conducted in the early spring and during an optimal time to inventory the existing biological resources.

⁶ U.S. Fish and Wildlife Service. 2013. List of Federal Endangered and Threatened Species that Occur in or may be Affected by Projects within the San Francisco North and San Francisco South, California USGS 7.5" Topographic Quadrangles, Sacramento Fish & Wildlife Office, Document Number: 130116015431. January 16.

⁷ U.S. Fish and Wildlife Service. 2013. *Critical Habitat Portal*. Available: <<http://criticalhabitat.fws.gov/>>. Accessed: January 16, 2013.

⁸ U.S. Fish and Wildlife Service. 2013. *National Wetlands Inventory*. Available: <<http://www.fws.gov/wetlands/>>. Accessed: January 16, 2013.

⁹ City and County of San Francisco Planning Department. 2013. *San Francisco Municipal Code*, Article 1.2 (Dimensions, Areas, and Open Spaces), Section 139 (Standards for Bird Safe Buildings). Available: <[http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca\\$sanc=JD_139](http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sanc=JD_139)>. Accessed: January 16, 2013.

¹⁰ City and County of San Francisco Planning Department. 2013. *San Francisco Municipal Code*, Article 16 (Urban Forestry Ordinance). Available: <[http://www.amlegal.com/nxt/gateway.dll/California/publicworks/article16urbanforestryordinance?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca](http://www.amlegal.com/nxt/gateway.dll/California/publicworks/article16urbanforestryordinance?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca)>. <[http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca\\$sanc=JD_139](http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sanc=JD_139)>. Accessed: January 17, 2013.

¹¹ City and County of San Francisco Planning Department. 2012. *Urban Bird Refuge Poster*. Available: <http://www.sf-planning.org/ftp/files/publications_reports/library_of_cartography/Urban_Bird_Refuge_Poster.pdf>. Accessed: December 6, 2012.

The approximately 39-acre Project site is located in the southeast corner of the San Francisco North, California USGS 7.5-minute topographic quadrangle in San Francisco County, California. The Project site is primarily surrounded by urban development (e.g., single- and multi-family residences, schools, and industrial developments), and is located one and one-half blocks west of Interstate 280 (I-280), four blocks east of U.S. Highway 101 (US 101), and two blocks north of Cesar Chavez Street. The site is bordered to the immediate north and northwest by the Potrero Hill Recreation Center, which is situated within property that supports open space greater than two acres in size and is considered part of the Urban Bird Refuge complex delineated by the San Francisco Planning Department.¹² The eastern edge of the Project site sits on a ridge paralleling Pennsylvania Street below. The Project site itself is urban, being comprised almost entirely of existing multi-family residences, associated landscaping, and roads.

The topography that characterizes the Project site is steep, with elevations ranging from 265 feet above mean sea level (msl) to the north at the intersection 23rd Street and Arkansas Street, and 40 feet above msl to the south at the intersection of 26th Street and Connecticut Street. Vegetation that characterizes the Project site is typical of highly disturbed, urban environments, and consists primarily of nonnative ornamental trees and shrubs, and ruderal (weedy) herbaceous vegetation. Very few, common (nonsensitive) native plant species were observed within limited portions of the site. Vegetation communities and associated plant species inventoried during the March 3, 2011, general biological survey are described in further detail below. The Project site is composed entirely of disturbed and developed uplands, and no drainage features or wetlands are present on or adjacent to the site.

Development of the Project site has degraded biological resources. The general area experiences a high volume of vehicular traffic, which creates disturbances associated with noise and light. In addition, the general area is regularly used by pedestrians, which has led to encroachment into any remaining undeveloped areas, accumulation of litter, and use by domestic pets. The Project site contains a high number of nonnative and exotic ornamental plant species and an accumulation of domestic garbage and other debris. The result is degradation of the existing habitat and limited use by most wildlife species.

¹²City and County of San Francisco Planning Department. 2012. *Urban Bird Refuge Poster*. Available: <http://www.sf-planning.org/ftp/files/publications_reports/library_of_cartography/Urban_Bird_Refuge_Poster.pdf>. Accessed: December 6, 2012.

■ **Special-Status Plant and Wildlife Species**

For the purposes of this study, special-status species and their critical habitat include:

- Species listed, proposed, or candidate species for listing as Threatened or Endangered by the USFWS and lands designated as Critical Habitat pursuant to the federal Endangered Species Act (FESA) of 1969, as amended;
- Species listed as Rare, Threatened, or Endangered by the CDFW pursuant to the California Endangered Species Act (CESA) of 1970, as amended;
- Species designated as Fully Protected under Sections 3511 (birds), 4700 (mammals), and 5050 (reptiles and amphibians) of the California Fish and Wildlife Code (CFW Code);
- Species designated by the CDFW as California Species of Special Concern;
- Plant species designated as List 1B and 2 by the CNPS; and
- Species not currently protected by statute or regulation, but considered rare, threatened or endangered under CEQA (Section 15380).

Table 4.15-1 presents a list of selected special-status plant and wildlife species that have been reported within approximately 5 miles of the Project site, along with a description of their habitat requirements, protection status, and a brief discussion of their likelihood to occur within the Project site. No sensitive natural communities have been reported within approximately 5 miles of the Project site; none were determined to occur based on the March 3, 2011 general biological survey.

As shown in Table 4.15-1, a total of 49 special-status plant species and four special-status wildlife species reported at locations within approximately 5 miles of the Project site have been analyzed for their potential to occur. Due to the highly urbanized nature and lack of native or naturalized habitat on and in the immediate vicinity of the Project site, none of the special-status plant and wildlife species included within Table 4.15-1 was determined to have a potential to occur on-site. Many of the special-status wildlife species known to occur in the region would not be expected to use the Project site or immediate vicinity due to the highly urbanized nature of the site; lack of suitable habitat; isolation of the site in relation to suitable or occupied habitat in the region; presence of nonnative wildlife species; and, urban uses as described above.

Many of the special-status plant species recorded in the region reflect historical data and reporting that predates development. As such, these species are believed to have been extirpated (eliminated) from the area as a result of habitat conversion and previous vegetation removal and grading activities for existing developments. Limited portions of the site are mapped as supporting serpentine outcrops which provide marginal soil conditions for several special-status plant species known to occur in the region. However, as described in further detail below, the serpentine outcrops are situated within land that is highly disturbed as a result of existing developments and ongoing disturbances. As such, the areas are generally unsuitable for special-status plants. The serpentine outcrop areas were carefully inspected and inventoried for existing vegetation during the March 3,

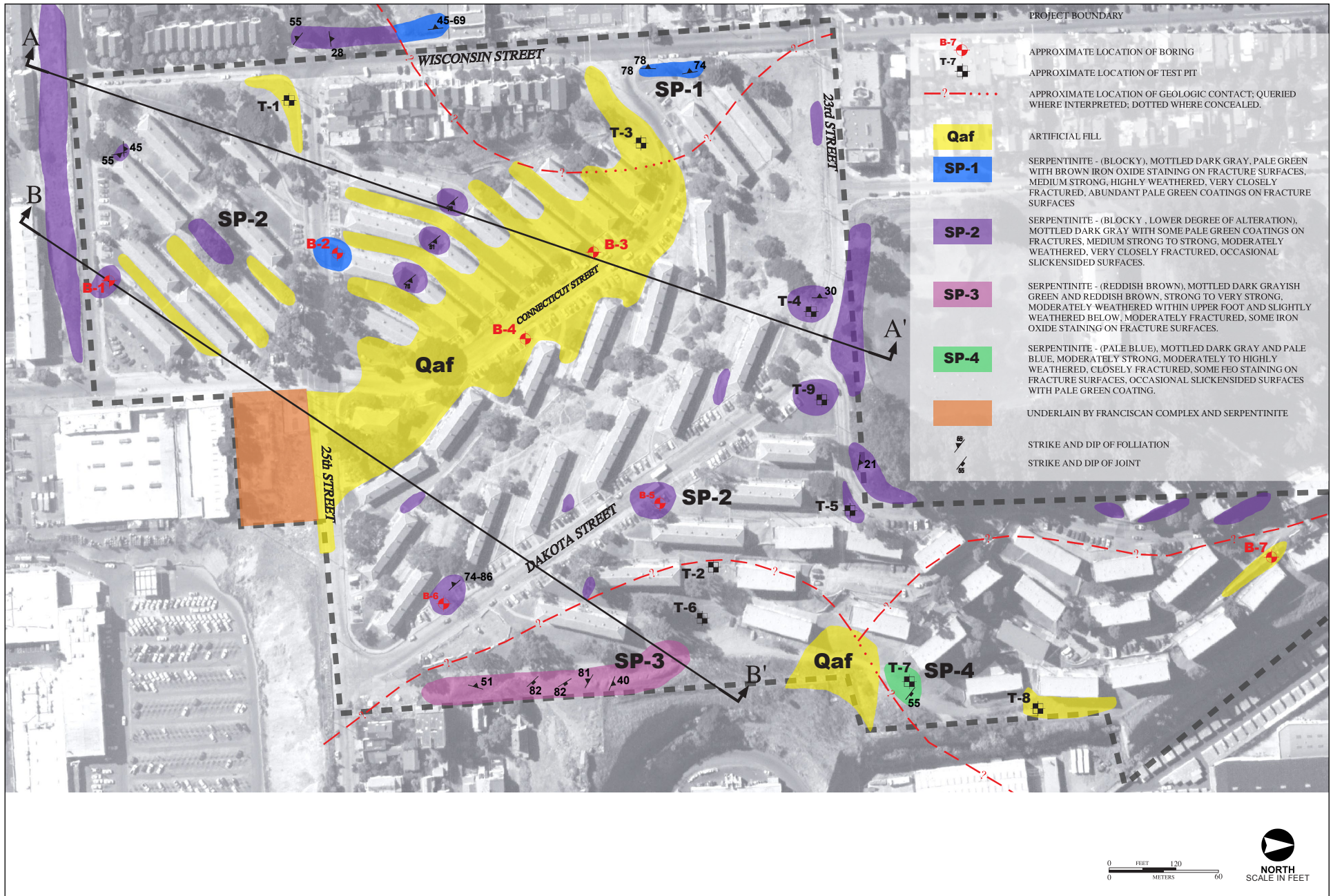
2011 general biological survey; no special-status plant species were observed and existing conditions were determined to be very poor. Further discussion regarding potential for special-status plant species to occur is provided within Table 4.15-1 and subsequent narrative describing the vegetation communities and plant species observed on site.

■ **Vegetation Communities**

Urban Landscaping with Serpentine Outcrops. Several scattered serpentine outcrops are present throughout the disturbed and developed portions of the Project site, which is largely characterized by nonnative ornamental landscaping and ruderal vegetation. Serpentine soils are derived from serpentinite. Serpentine often becomes exposed in tectonically active regions and its unique chemical composition creates a soil chemistry that is toxic to many plant species. In undisturbed and undeveloped areas, grasslands that are supported by serpentine soils in the region are generally known to be dominated by native, perennial bunchgrasses. Typically, nonnative species are not adapted to grow on toxic, low-nutrient, and low-moisture serpentine soil conditions. Native plant species known to the region that have adapted to serpentine soils are often very localized in occurrence, and many are considered rare.

As included within Table 4.15-1, 14 special-status plant species associated with serpentine soils have been analyzed for their potential to occur within the Project site. None of these species were determined to have a potential to occur within the site primarily due to lack of suitable vegetation associations (i.e., the areas supporting serpentine soils are characterized by disturbed bare earth and nonnative vegetation), incompatible land uses, existing disturbances, and the fact that they were not observed during the March 3, 2011, survey. In addition to being associated with serpentine soils, the 14 special-status plant species included within Table 4.15-1 are known to occur in association with other native plant species. The Project site is characterized by a strong dominance of nonnative plant species and, as discussed below, only several native plant species were observed during the March 3, 2011, survey. Therefore, although marginal serpentine soils exist, suitable vegetation associations and naturalized conditions do not occur on the Project site for any of the 14 special-status plant species included within Table 4.15-1.

While historically the outcrops on the Project site and surrounding area may have supported native serpentine grassland, the site was developed as multifamily housing in 1941 and 1955. As a result, the site currently consists of pavement, buildings or other hardscape, lawns and other landscaping, and disturbance from local residents that have occurred for approximately 70 years. As shown in Figure 4.15-1, most of these areas are distributed among the existing buildings. The majority of undeveloped areas within the Project site are routinely mowed, maintained, and artificially irrigated for landscaping purposes. As a result, the conditions are unsuitable for most native plant species and only nonnative plant species occur.



SOURCE: ENGEO Corporation, 2009.

MAP BASE SOURCE: USGS Terraserver, 2009.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.15-1: SERPENTINE OUTCROP LOCATIONS

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

<i>Scientific Name</i>	<i>Common Name</i>	<i>CNPS/CESA/FESA</i>	<i>Habitat</i>	<i>Elevation Low/High (meters)^a</i>	<i>Likelihood of Occurrence</i>
PLANTS					
<i>Amsinckia lunaris</i>	Bent-flowered fiddleneck	1B.2/None/None	Occurs in coastal bluff scrub, cismontane woodland, and valley and foothill grassland habitats. Blooms from March to June.	3/500	None: No scrub, woodland, or suitable grassland habitat occurs on the Project site for this species. What little undeveloped area that remains on the site is highly disturbed and dominated by nonnative vegetation.
<i>Arabis blepharophylla</i>	Coast rock cress	4.3/None/None	Occurs in broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub on rocky soils. Blooms February to May.	3/1,100	None: No forest, scrub, or prairie habitat supported by rocky soils occurs on the Project site. What little undeveloped area that remains on the site is highly disturbed and dominated by nonnative vegetation.
<i>Arctostaphylos franciscana</i>	Franciscan manzanita	1B.1/None/None	Occurs in coastal scrub on serpentinite soils. Blooms February to April.	60/300	None: No scrub occurs on the Project site for this species. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. Further, this manzanita species is a perennial shrub that is readily identifiable throughout the year and no manzanitas were observed on the site during the March 3, 2011, survey.
<i>Arctostaphylos imbricata</i>	San Bruno Mountain manzanita	1B.1/SE/None	Occurs in chaparral, coastal scrub on rocky soils. Blooms February to May.	275/370	None: No chaparral or scrub supported by rocky soils occurs on the Project site. The site is situated well below the known elevation range for this species. Further, this manzanita species is a perennial shrub that is readily identifiable throughout the year and no manzanitas were observed on the site during the March 3, 2011, survey.
<i>Arctostaphylos montana</i> ssp. <i>ravenii</i>	Presidio manzanita	1B.1/SE/FE	Occurs in chaparral, coastal prairie, and coastal scrub on serpentinite outcrops. Blooms February to March. Known from only one extant native occurrence at the Presidio in San Francisco; plants there belong to a single clone. Five of six historical occurrences extirpated by urbanization.	45/215	None: No chaparral, prairie or scrub habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, the site is situated below the known elevation range for this species and previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. Further, this manzanita species is a perennial shrub that is readily identifiable throughout the year and no manzanitas were observed on the site during the March 3, 2011, survey.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

<i>Scientific Name</i>	<i>Common Name</i>	<i>CNPS/CESA/FESA</i>	<i>Habitat</i>	<i>Elevation Low/High (meters)^a</i>	<i>Likelihood of Occurrence</i>
<i>Arctostaphylos montaraensis</i>	Montara manzanita	1B.2/None/None	Occurs in maritime chaparral, and coastal scrub. Blooms January to March.	150/500	None: No chaparral or scrub habitat occurs on the Project site. The site is situated below the known elevation range for this species. Further, this manzanita species is a perennial shrub that is readily identifiable throughout the year and no manzanitas were observed on the site during the March 3, 2011, survey.
<i>Arctostaphylos pacifica</i>	Pacific manzanita	1B.2/SE/None	Occurs in chaparral, and coastal scrub. Blooms February to April.	330/330	None: No chaparral or scrub habitat occurs on the Project site. The site is situated well below the known elevation range for this species. Further, this manzanita species is a perennial shrub that is readily identifiable throughout the year and no manzanitas were observed on the site during the March 3, 2011, survey.
<i>Arenaria paludicola</i>	Marsh sandwort	1B.1/CE/FE	Occurs in freshwater and brackish marshes and swamps on openings in sandy soils. Blooms May to August.	3/170	None: No marsh or swamp habitat occurs on the Project site.
<i>Aspidotis carlotta-halliae</i>	Carlotta Hall's lace fern	4.2/None/None	Occurs in chaparral, and cismontane woodland, generally on serpentinite soils. Blooms January to December.	100/1,400	None: No chaparral or woodland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, the site is situated below the known elevation range for this species and previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. Further, this manzanita species is a perennial shrub that is readily identifiable throughout the year and no manzanitas were observed on the site during the March 3, 2011, survey.
<i>Astragalus nuttallii</i> var. <i>nuttallii</i>	Ocean bluff milk-vetch	4.2/None/None	Occurs in coastal bluff scrub and coastal dunes. Blooms January to November.	3/120	None: No coastal scrub or dune habitat occurs on the Project site.
<i>Astragalus tener</i> var. <i>tener</i>	Alkali milk-vetch	1B.2/None/None	Occurs in playas, valley and foothill grassland in adobe clay soil substrates, and vernal pools with alkaline soils. Blooms April to May.	1/60	None: No playas or suitable grassland habitat supported by clay soils occur on the Project site. Further, no vernal pools supported by alkaline soils occur.
<i>Carex comosa</i>	Bristly sedge	2.1/None/None	Occurs in coastal prairie, marshes and swamps along lake margins, and in valley and foothill grassland. Blooms from May to September.	0/625	None: The Project site is characterized by uplands and no coastal prairie, marsh, swamp, lake margin, or suitable grassland habitat occurs.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

Scientific Name	Common Name	CNPS/CESA/FESA	Habitat	Elevation Low/High (meters)^a	Likelihood of Occurrence
<i>Centromadia parryi</i> ssp. <i>parryi</i>	Pappose tarplant	1B.2/None/None	Occurs in chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), and vernal mesic valley and foothill grassland, often on alkaline soils. Blooms May to November.	2/420	None: No chaparral, coastal prairie, meadow and seep, marsh, swamp, or suitable vernal mesic grassland habitat supported by alkaline soils occurs on the Project site.
<i>Chloropyron maritimum</i> ssp. <i>palustre</i>	Point Reyes bird's-beak	1B.2/None/None	Occurs in coastal salt marsh and swamp habitat. Blooms from June to October.	0/10	None: No marsh or swamp habitat occurs on the Project site. Further, the Project site occurs above the known elevation range for this species.
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	San Francisco Bay spineflower	1B.2/None/None	Occurs in coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub on sandy soils. Blooms April to July (occasionally into August).	3/215	None: No coastal scrub, dune, or prairie habitat supported by sandy soils occurs on the Project site.
<i>Chorizanthe robusta</i> var. <i>robusta</i>	Robust spineflower	1B.1/None/FE	Occurs in chaparral (maritime), cismontane woodland (openings), coastal dunes, and coastal scrub on sandy or gravelly soils. Blooms April to September.	3/300	None: No chaparral, woodland, coastal dune or scrub habitat supported by sandy or gravelly soils occurs on the Project site.
<i>Cirsium andrewsii</i>	Franciscan thistle	1B.2/None/None	Occurs in broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub on mesic, sometimes serpentinite soils. Blooms March to July.	0/150	None: No forest, coastal scrub or prairie habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. Further, this species was not observed during the March 3, 2011, survey, which occurred during this species' recognized blooming period.
<i>Cirsium occidentale</i> var. <i>compactum</i>	Compact cobwebby thistle	1B.2/None/None	Occurs in chaparral, coastal dunes, coastal prairie, and coastal scrub. Blooms April to June.	5/150	None: No chaparral, or coastal dune, prairie, or scrub habitat occurs on the Project site.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

<i>Scientific Name</i>	<i>Common Name</i>	<i>CNPS/CESA/FESA</i>	<i>Habitat</i>	<i>Elevation Low/High (meters)^a</i>	<i>Likelihood of Occurrence</i>
<i>Clarkia franciscana</i>	Presidio clarkia	1B.1/SE/FE	Occurs in coastal scrub, and valley and foothill grassland on serpentinite soils. Blooms May to July. Known from fewer than five occurrences.	25/335	None: No coastal scrub or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. All known local occurrences for this extremely rare species are restricted to the Presidio area, which is located approximately 4.0 miles northwest of the site. This species is not likely to occur within the Project site.
<i>Collinsia corymbosa</i>	Round-headed Chinese-houses	1B.2/None/None	Occurs in coastal dunes. Blooms April to June.	0/20	None: No coastal dune habitat occurs on the Project site.
<i>Collinsia multicolor</i>	San Francisco collinsia	1B.2/None/None	Occurs in closed-cone coniferous forest, and coastal scrub, sometimes on serpentinite soils. Blooms March to May.	30/250	None: No coniferous forest or coastal scrub habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. Further, this species was not observed during the March 3, 2011, survey, which occurred during this species' recognized blooming period.
<i>Equisetum palustre</i>	Marsh horsetail	3/None/None	Occurs in marshes and swamps. The blooming period for this species is currently unknown, but it would be readily identifiable regardless of its blooming status due to the fact it's life form is a perennial that propagates from rhizomes.	45/1,000	None: The Project site is characterized by uplands and no marsh or swamp habitat occurs.
<i>Eriophorum gracile</i>	Slender cottongrass	4.3/None/None	Occurs in bogs and fens, meadows and seeps, and upper montane coniferous forest on acidic soils. Blooms May to September.	1,280/2,900	None: No bog and fen, meadow and seep, or coniferous forest supported by acidic soils occurs on the Project site. Further, the site occurs well below the known elevation range for this species.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

<i>Scientific Name</i>	<i>Common Name</i>	<i>CNPS/CESA/FESA</i>	<i>Habitat</i>	<i>Elevation Low/High (meters)^a</i>	<i>Likelihood of Occurrence</i>
<i>Erysimum franciscanum</i>	San Francisco wallflower	4.2/None/None	Occurs in chaparral, coastal dunes, coastal scrub, and valley and foothill grassland, often on serpentinite or granitic soils, sometimes along roadsides. Blooms March to June.	0/550	None: No chaparral, coastal dune, scrub, or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. Further, this species was not observed during the March 3, 2011, survey, which occurred during this species' recognized blooming period.
<i>Fritillaria liliacea</i>	Fragrant fritillary	1B.2/None/None	Occurs in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland habitats often in association with serpentinite soils. Blooms from February to April.	3/410	None: No woodland, coastal prairie, scrub, or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. Further, this species was not observed during the March 3, 2011, survey, which occurred during this species' recognized blooming period.
<i>Gilia capitata</i> ssp. <i>chamissonis</i>	Blue coast gilia	1B.1/None/None	Occurs in coastal dunes, and coastal scrub. Blooms from April to July.	2/200	None: No coastal dune or scrub habitat occurs on the Project site.
<i>Gilia millefoliata</i>	Dark-eyed gilia	1B.2/None/None	Occurs in coastal dunes. Blooms April to July.	2/30	None: No coastal dune habitat occurs on the Project site.
<i>Grindelia hirsutula</i> var. <i>maritima</i>	San Francisco gumplant	1B.2/None/None	Occurs in coastal bluff scrub, coastal scrub, and valley and foothill grassland on sandy or serpentinite soils. This perennial grows up to 1.5 meters tall and its branches and leaves are readily identifiable all year long. Blooms June to September.	15/400	None: No coastal scrub or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. This conspicuous perennial gumplant was not observed during the March 3, 2011, survey.
<i>Helianthella castanea</i>	Diablo helianthella	1B.2/None/None	Occurs in broad-leafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland habitats. Blooms from March to June.	60/1,300	None: No upland forest, chaparral, upland woodland, coastal scrub, riparian woodland, or suitable grassland habitat occurs on the Project site.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

<i>Scientific Name</i>	<i>Common Name</i>	<i>CNPS/CESA/FESA</i>	<i>Habitat</i>	<i>Elevation Low/High (meters)^a</i>	<i>Likelihood of Occurrence</i>
<i>Hemizonia congesta</i> ssp. <i>congesta</i>	Pale yellow hayfield tarplant	1B.2/None/None	Occurs in valley and foothill grassland, sometimes along roadsides. Blooms from April to November.	20/560	None: No suitable grassland habitat occurs on the Project site.
<i>Hesperevax sparsiflora</i> var. <i>brevifolia</i>	Short-leaved evax	1B.2/None/None	Occurs in coastal bluff scrub on sandy soils, and coastal dunes. Blooms March to June.	0/215	None: No coastal bluff scrub supported by sandy soils or coastal dune habitat occurs on the Project site.
<i>Hesperolinon congestum</i>	Marin western flax	1B.1/ST/FT	Occurs in chaparral and valley and foothill grassland habitats in association with serpentine soils. Blooms from April to July.	5/370	None: No chaparral or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. The closest reported record for this extremely rare species dates back to 1905 and occurs in an area that has been completely developed approximately 2.0 miles northwest of the site. This species is not likely to occur within the Project site.
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	Kellogg's horkelia	1B.1/None/None	Occurs in openings in closed-cone coniferous forest, chaparral (maritime), coastal dunes, and coastal scrub on sandy or gravelly soils. Blooms from April to September.	10/200	None: No forest, chaparral, coastal dune or scrub habitat supported by sandy or gravelly soils occurs on the Project site.
<i>Iris longipetala</i>	Coast iris	4.2/None/None	Occurs on mesic sites in coastal prairie, lower montane coniferous forest, and meadows and seeps. Blooms March to May.	0/600	None: The Project site is characterized by uplands and no coastal prairie, forest, or meadow and seep habitat occurs on the Project site.
<i>Layia carnosa</i>	Beach layia	1B.1/SE/FE	Occurs in coastal dunes, and coastal scrub on sandy soils. Blooms from March to July.	0/60	None: No coastal dune or scrub habitat supported by sandy soils occurs within the Project site.
<i>Leptosiphon rosaceus</i>	Rose leptosiphon	1B.1/None/None	Occurs in coastal bluff scrub. Blooms from April to July.	0/100	None: No coastal bluff scrub occurs within the Project site.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

<i>Scientific Name</i>	<i>Common Name</i>	<i>CNPS/CESA/FESA</i>	<i>Habitat</i>	<i>Elevation Low/High (meters)^a</i>	<i>Likelihood of Occurrence</i>
<i>Lessingia germanorum</i>	San Francisco lessingia	1B.1/SE/FE	Occurs in coastal scrub (on remnant dunes). Blooms July to November, but occasionally starts as early as June.	25/110	None: No coastal scrub or remnant dune habitat occurs on the Project site.
<i>Malacothamnus arcuatus</i>	Arcuate bush-mallow	1B.2/None/None	Occurs in chaparral, and cismontane woodland. Blooms April to September.	15/355	None: No chaparral or cismontane woodland occurs on the Project site.
<i>Micropus amphibolus</i>	Mt. Diablo cottonweed	3.2/None/None	Occurs in broadleafed upland forest, chaparral, cismontane woodland, and valley and foothill grassland on rocky soils. Blooms March to May.	45/825	None: No forest, chaparral, cismontane woodland, or suitable grassland supported by rocky soils occurs on the Project site.
<i>Microseris paludosa</i>	Marsh microseris	1B.2/None/None	Occurs in closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Blooms April to June (occasionally into July).	5/300	None: No forest, cismontane woodland, coastal scrub, or suitable grassland habitat occurs on the Project site.
<i>Pentachaeta bellidiflora</i>	White-rayed pentachaeta	1B.1/SE/FE	Occurs in valley and foothill grasslands in association with serpentine soils. Blooms from March to May.	35/620	None: No suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. There are no reported records for this species within the city of San Francisco. Further, this species was not observed during the March 3, 2011, survey, which occurred during this species' recognized blooming period.
<i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	Choris' popcorn-flower	1B.2/None/None	Occurs in chaparral, coastal prairie, and coastal scrub on mesic soils. Blooms from March to June.	15/160	None: No chaparral, coastal prairie or scrub supported by mesic conditions occurs on the Project site.
<i>Plagiobothrys diffusus</i>	San Francisco popcorn-flower	1B.1/SE/None	Occurs in coastal prairie, and valley and foothill grassland. Blooms from March to June. Known only from approximately ten occurrences.	60/360	None: No coastal prairie or suitable grassland habitat occurs on the Project site.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

<i>Scientific Name</i>	<i>Common Name</i>	<i>CNPS/CESA/FESA</i>	<i>Habitat</i>	<i>Elevation Low/High (meters)^a</i>	<i>Likelihood of Occurrence</i>
<i>Polemonium carneum</i>	Oregon polemonium	2.2/None/None	Occurs in coastal prairie, coastal scrub, and lower montane coniferous forest. Blooms April to September.	0/1,830	None: No coastal prairie, scrub, or forest habitat occurs on the Project site.
<i>Sanicula maritima</i>	Adobe sanicle	1B.1/CR/None	Occurs in chaparral, coastal prairie, meadows and seeps, and valley and foothill grassland on clay and/or serpentinite soils. Blooms from February to May. Known from fewer than twenty occurrences.	30/240	None: No chaparral, coastal prairie, meadow and seep, or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. This species was not observed during the March 3, 2011, survey, which occurred during this species' recognized blooming period. A historical record dating back to 1895 is reported at an off-site location to the immediate north of the Project site; however, developments currently exist at the reported location and the species has likely been extirpated from the area.
<i>Silene verecunda</i> ssp. <i>verecunda</i>	San Francisco campion	1B.2/None/None	Occurs in coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland on sandy soils. Blooms March to June (occasionally into August).	30/645	None: No coastal scrub, chaparral, prairie, or suitable grassland habitat supported by sandy soils occurs on the Project site.
<i>Stebbinsoseris decipiens</i>	Santa Cruz microseris	1B.2/None/None	Occurs in broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland in open areas, sometimes on serpentinite soils. Blooms April to May.	10/500	None: No forest, chaparral, coastal prairie, scrub or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. There are no reported records for this species in the city of San Francisco. The closest reported occurrence for this species is approximately 15.0 miles northwest of the Project site near Mt. Tamalpais State Park. This species is not likely to occur within the Project site.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

Scientific Name	Common Name	CNPS/CESA/FESA	Habitat	Elevation Low/High (meters) ^a	Likelihood of Occurrence
<i>Triphysaria floribunda</i>	San Francisco owl's-clover	1B.2/None/None	Occurs in coastal prairie, coastal scrub, and valley and foothill grassland, usually on serpentinite soils. Blooms April to June.	10/160	None: No forest, chaparral, coastal prairie, scrub or suitable grassland habitat occurs on the Project site. Serpentine outcrops are present within limited portions of the site; however, previous developments and ongoing disturbance at the site make presence of this and other special-status plant species very unlikely. A historical record dating back to 1881 is reported at an off-site location to the immediate north of the Project site; however, developments currently exist at the reported location and the species has likely been extirpated from the area.
<i>Triquetrella californica</i>	Coastal triquetrella	1B.2/None/None	Occurs in coastal bluff scrub, and coastal scrub. This species is a moss that grows directly on soil substrates. Known in California from fewer than ten small coastal occurrences.	10/100	None: No coastal scrub occurs on the Project site. The undeveloped soils that remain on the site do not likely provide suitable conditions for this species.
WILDLIFE					
Invertebrates					
<i>Danaus plexippus</i>	Monarch butterfly	(N/A)/None/S3 Winter roosting sites protected by CDFW	Eucalyptus groves used as winter roost sites. Typically use the same groves year after year.	(N/A)	None: Eucalyptus trees present, but no records in the CNDDDB of this species utilizing the Project site for winter roosting.
Mammals					
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	(N/A)/None/CSC, S2S3	Roosts in the open in large caves, abandoned mines and abandoned buildings. Very sensitive to roost disturbance and human activity.	N/A	None: No suitable caves, mines or abandoned buildings on the Project site. High level of human activity in the area also a likely deterrent.
<i>Lasiurus blossevillii</i>	Western red bat	(N/A)/None/CSC, S3	Typically occurs in association with riparian woodlands. Roosts in the foliage of riparian trees such as cottonwoods and sycamores.	N/A	None: Numerous trees present on site, but no riparian habitat, cottonwoods, or sycamore trees on the Project site.

Table 4.15-1 Special-Status Plant and Wildlife Species Reported in the Vicinity (Approximately 5 Miles) of the Project Site

Scientific Name	Common Name	CNPS/CESA/FESA	Habitat	Elevation Low/High (meters) ^a	Likelihood of Occurrence
<i>Lasiurus cinereus</i>	hoary bat	(N/A)/None/S4	Solitary, foliage roosting species that is infrequently observed. Roosts are typically outside of urban areas. Forages in open areas or forest habitat edges.	N/A	None: Numerous trees present on site, but no riparian or woodland habitat on the Project site. Project site and surrounding region very urbanized.

a. Project area elevation ranges from 12 to 80 meters above msl.

Status:

<u>CNPS</u>	<u>State</u>	<u>Federal</u>
1A Presumed extinct	SE State listed as Endangered	FE Federally listed as Endangered
1B California Native Plant Society (CNPS) Ranking. Defined as plants that are rare, threatened, or endangered in California and elsewhere.	ST State listed as Threatened	FT Federally listed as Threatened
2 California Native Plant Society (CNPS) Ranking. Defined as plants that are rare, threatened, or endangered in California, but more common elsewhere.	SD Delisted by the State	
3 Plants about which more information is needed	CR California rare	
4 Plants of limited distribution - a watch list	CSC California Department of Fish and Game designated "Species of Special Concern"	
	FP Fully Protected	
	WL CDFW Watch List	
	S1 Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres	
	S1.1 Very threatened	
	S2 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres	
	S2.1 Very threatened	
	S3 21-100 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres	
	S3.1 Very threatened	
	S4 Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.	

Likelihood of occurrence evaluations:

- A rating of "Known" indicates that the species has been observed on the site.
- A rating of "High" indicates that the species has not been observed, but sufficient information is available to indicate suitable habitat and conditions are present on-site and the species is expected to occur on site.
- A rating of "Moderate" indicates that it is not known if the species is present, but suitable habitat exists on-site.
- A rating of "Low" indicates that species was not found during biological surveys conducted to date on the site and may not be expected given the species' known regional distribution or the quality of habitats located on the site.
- A rating of "None" indicates that the species would not be expected to occur on the Project site because the site does not include the known range or does not support suitable habitat.

One area, a steep grassy slope south of 23rd Street where it intersects with Arkansas Street, was fallow and did not display signs of intense maintenance at the time of the survey. However, close inspection of this area revealed a very large percent coverage of the nonnative plant species described below. Plant species observed on and around the serpentine outcrops consist primarily of nonnative lawn grasses (e.g., bluegrass [*Poa* sp.], rye grass [*Lolium* sp.], fescue [*Festuca* sp.], and Bermuda grass [*Cynodon dactylon*]). Other nonnative plant species observed in these areas included a variety of nonnative grasses and forbs including wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), rip-gut brome (*Bromus diandrus*), and Italian ryegrass (*Lolium multiflorum*), dallis grass (*Paspalum dilatatum*), pineapple weed (*Chamomilla suaveolens*), curly dock (*Rumex crispus*), cheeseweed (*Malva parviflora*), prickly lettuce (*Lactuca serriola*), fennel (*Foeniculum vulgare*), bristly ox-tongue (*Picris echioides*), vetch (*Vicia* sp.), and English plantain (*Plantago lanceolata*). Only two common native species were observed within the areas supported by serpentine soils during March 3, 2011, survey: California poppy (*Eschscholzia californica*) and a single western blue-eyed grass (*Sisyrinchium bellum*). Neither of these native plants is a special-status species listed in Table 4.15-1.

Two off-site areas also support serpentine outcrops. These off-site areas are associated with historically disturbed land that is apparently unmaintained, including a large serpentine outcrop along the east side of Texas Street, and a steep slope south of 26th Street near the southern terminus of Wisconsin Street (Figure 4.15-1). Similar to the serpentine outcrops on the Project site, these off-site areas are also characterized by nonnative vegetation. Due to lack of suitable vegetation associations, historical disturbances, and isolation from known populations, these off-site areas are not likely to support any of the special-status plant species analyzed in Table 4.15-1. The serpentine outcrops in these off-site areas are not expected to be disturbed as a result of the Proposed Project.

Ornamental Trees and Shrubs. A tree survey was conducted of the Project site by GLS Landscape/Architecture, the results of which are presented in a Tree Disclosure Submittal,¹³ dated June 23, 2010. A Tree Disclosure Statement¹⁴ form, dated June 28, 2010, has also been prepared for the Proposed Project as part of the project application process with the San Francisco Planning Department.

Significant trees are defined under the San Francisco Urban Forestry Ordinance as “any trees within 10 feet of a lot line abutting a public right-of-way that are above 20 feet in height, or with a canopy greater than 15 feet in diameter, or with a trunk greater than 12 inches in diameter at breast

¹³ GLS Landscape/Architecture. 2010. *Tree Disclosure Submittal for Rebuild Potrero*. June 23. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁴ City and County of San Francisco Planning Department. 2010. *Tree Disclosure Statement Form for Rebuild Potrero*. June 28.

height.”¹⁵ A total of 254 significant trees were identified as occurring on or adjacent to the Project site.

Of the total 254 significant trees identified, 249 significant trees occur on the Project site and five significant trees occur on an adjacent property overhanging the site.¹⁶ The Project site does not support any street trees or landmark trees, as defined under the San Francisco Urban Forestry Ordinance.¹⁷

As identified in the Tree Disclosure Submittal and confirmed during the March 3, 2011, field visit, all significant trees inventoried within the Project site are nonnative species with the exception of two native cultivar species that had been previously planted and introduced to the site. The two native significant tree species planted and introduced onto the site include Monterey cypress (*Cupressus macrocarpa*) and Monterey pine (*Pinus radiata*). Nonnative significant trees observed include blue gum (*Eucalyptus globulus*), red flowering gum (*Eucalyptus ficifolia*), narrow leaf peppermint (*Eucalyptus puchella*), silver dollar gum (*Eucalyptus polyanthemos*), red ironbark (*Eucalyptus sideroxylon*), white iron bark (*Eucalyptus leucoxylon*), swamp mahogany (*Eucalyptus robusta*), Italian stone pine (*Pinus pinea*), Chinese elm (*Ulmus parviflora*), blackwood acacia (*Acacia melanoxylon*), silver wattle (*Acacia dealbata*), Sydney golden wattle (*Acacia longifolia*), Peruvian pepper (*Schinus molle*), olive (*Olea europaea*), and Ngaio tree (*Myoporum laetum*).

Of the 254 trees identified in the Tree Disclosure Submittal, 177 are in fair or better condition with the remaining 77 in poor condition. Problems specifically identified in the report include eight trees infested by thrips, four trees with poor structure, five trees with pitch canker, one tree with embedded bark and one tree that had been topped.

■ General Wildlife

Due to the dense urban development within the Project site and surrounding region, wildlife use in these areas is limited to those species most tolerant of urban environments and human activity.

¹⁵ City and County of San Francisco Planning Department. 2013. *San Francisco Municipal Code*, Article 16 (Urban Forestry Ordinance), Section 810A (Significant Trees). Available: [http://www.amlegal.com/nxt/gateway.dll/California/publicworks/article16urbanforestryordinance?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca\\$sanc=JD_810A](http://www.amlegal.com/nxt/gateway.dll/California/publicworks/article16urbanforestryordinance?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sanc=JD_810A). [http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca\\$sanc=JD_139](http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sanc=JD_139) Accessed: January 17, 2013.

¹⁶ GLS Landscape/Architecture. 2010. *Tree Disclosure Submittal*. June 23. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁷ City and County of San Francisco Planning Department. 2013. *San Francisco Municipal Code*, Article 16 (Urban Forestry Ordinance), Section 802 (Definitions) and Section 810 (Landmark Trees). Available: [http://www.amlegal.com/nxt/gateway.dll/California/publicworks/article16urbanforestryordinance?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca](http://www.amlegal.com/nxt/gateway.dll/California/publicworks/article16urbanforestryordinance?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca). [http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:sanfrancisco_ca\\$sanc=JD_139](http://www.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sanc=JD_139) Accessed: January 17, 2013.

Species observed during the March 3, 2011, survey included American crow (*Corvus brachyrhynchos*), western scrub jay (*Aphelocoma coerulescens*), and rock dove (*Columba livia*). Other species expected to occur in this habitat include mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), house mouse (*Mus musculus*), black rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*) and feral cat (*Felis silvestris*). Anecdotal records of red-tailed hawk (*Buteo jamaicensis*) have been reported at the Project site, although no nest structures were observed in the area during the May 3, 2011 survey. Suitable nesting habitat occurs on and in the immediate vicinity of the site for common migratory birds and raptors, as discussed below.

Nesting Raptors. Numerous large trees, primarily gum trees (*Eucalyptus* spp.), are distributed throughout the Project site. These trees represent suitable nesting habitat for a variety of common raptors, including red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*). Although no nest structures were observed during the March 3, 2011, survey, which included an inspection of trees and shrubs for the presence or absence of nest structures, these species could potentially establish nests in the area, particularly where anecdotal sightings of red-tailed hawk have been reported. These common raptor species are not listed as threatened or endangered; however, they do receive protection pursuant to the Migratory Bird Treaty Act (MBTA) and CFW Code Section 3503.5, described under Regulatory Setting, in Section 5.15, *Biological Resources*, in this Draft EIR/EIS.

In addition, the ornamental trees and shrubs that occur on and in the immediate vicinity of the Project site provide suitable nesting habitat for several common resident and migratory songbirds known to the region that are also protected under the MBTA and CFW Code.

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4.16 GEOLOGY AND SOILS

4.16.1 Introduction

This section describes the geologic, seismic, soils, and topographic conditions on and around the Project site. Information in this section is based on the geotechnical investigations prepared by ENGEO Incorporated¹, as well as other published information cited in the footnotes. The geotechnical investigation is included as Appendix 4.16.

One comment was received during both the Notice of Preparation (NOP) and Notice of Intent (NOI) comment periods regarding the potential for development of the Project site to result in significant impacts on existing homes surrounding the Project area in the event of an earthquake.

4.16.2 Environmental Setting

■ Regional Geology

The Project site is located on the San Francisco Peninsula, on the western side of the California Coast Ranges geomorphic province. The Coast Ranges are a complex series of linear mountain ranges that lie more or less parallel to the coast and to the San Andreas Fault System. The Coast Ranges are composed primarily of Jurassic- and Cretaceous-age (206 to 65 million years ago) rocks that accumulated on the sea floor. These older rocks include a tectonic mix of sandstone, chert, altered basalt referred to as greenstone, and serpentinite, collectively referred to as the Franciscan Complex. While Franciscan bedrock is exposed in the hills and cliffs of San Francisco, the flanks of the hills are blanketed with thin to thick layers of colluvium and alluvium (weathered material washed downslope from the bedrock exposures). Valleys are filled with water-laid stream deposits.²

■ Regional Seismicity

The San Francisco Bay Area is in a seismically active region near the boundary between two major tectonic plates, the Pacific Plate to the southwest and the North American Plate to the northeast. The region's seismic faults can be classified as historically active, active, sufficiently active and well defined, or inactive,³ as defined below:

¹ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

² ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

³ California Geologic Survey, *Fault-Rupture Hazard Zones in California, Interim Revision 2007, Special Publication No. 42* (Sacramento, CA, 2007).

- **Historically active** faults are faults that have generated earthquakes accompanied by surface rupture during historic time (approximately the last 200 years) or that exhibit a seismic fault creep (slow incremental movement along a fault that does not entail earthquake activity).
- **Active** faults show geologic evidence of movement within Holocene time (approximately the last 11,000 years).
- **Sufficiently active and well-defined** faults show geologic evidence of movement during the Holocene along one or more of their segments or branches, and their trace may be identified by direct or indirect methods.
- **Inactive** faults show direct geologic evidence of inactivity (that is, no displacement) during all of Quaternary time or longer.

Although it is difficult to quantify the probability that an earthquake will occur on a specific fault, the preceding classification is based on the assumption that if a fault has moved during the last 11,000 years, it is likely to produce earthquakes in the future.

No known active faults cross the Project site, and the site is not located within an Alquist-Priolo Earthquake Fault Zone.⁴ The closest known active (surface) faults to the site are the San Andreas Fault, located about 6 miles to the southwest, the San Gregorio fault located about 10 miles to the west, and the Hayward fault located about 11 miles to the east.⁵

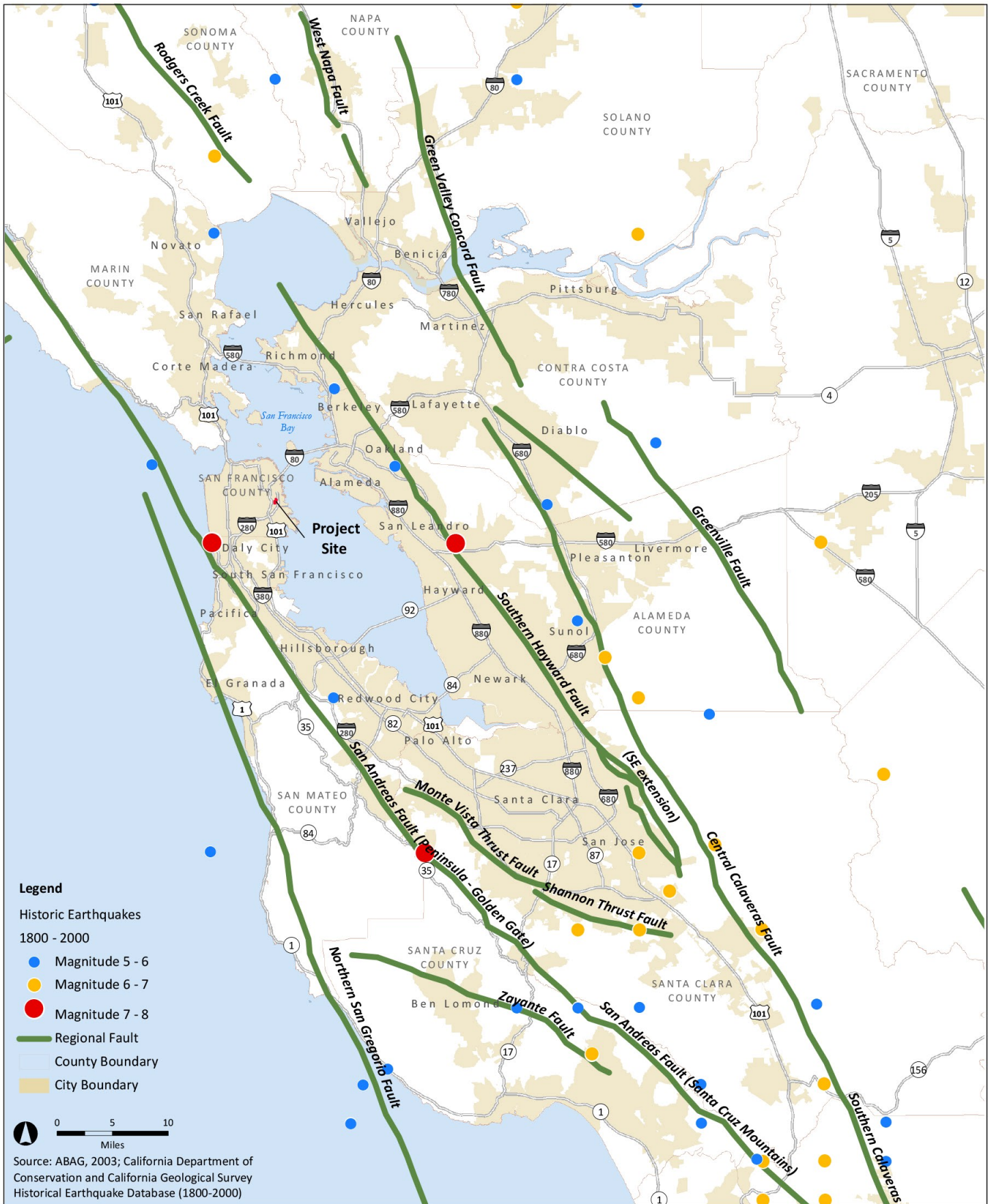
An earthquake can be classified quantitatively by the amount of energy released or qualitatively by the intensity of its effects on the surface. The amount of energy released during a seismic event has traditionally been quantified using the Richter scale. Recently, seismologists have begun using a moment magnitude (M) scale, developed in 1979, because it provides a more accurate measurement of the size of major and great earthquakes. For earthquakes of less than M 7.0, the moment magnitude and Richter magnitude scales are nearly identical. For earthquake magnitudes greater than M 7.0, readings on the moment magnitude scale are slightly greater than a corresponding Richter magnitude.

Large earthquakes, M value greater than 7, have historically occurred in the Bay Area and many earthquakes of low magnitude occur every year. Most earthquakes are concentrated along the San Andreas, Hayward, and Calaveras faults, as illustrated in Figure 4.16-1. The San Andreas, San Gregorio, and Hayward faults have estimated maximum M values of 7.9, 7.2, and 7.1, respectively.⁶

⁴ The Alquist-Priolo Earthquake Fault Zoning Act requires the California State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults. The project site is not within an Alquist-Priolo Earthquake Fault Zone.

⁵ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

⁶ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.



POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.16-1: REGIONAL FAULT MAP

The Working Group on California Earthquake Probabilities estimates there is a 21 percent probability that a moment magnitude M6.7 or greater earthquake will occur on the northern portion of the San Andreas Fault, while it estimates a 31 percent probability of the same magnitude event occurring on the Hayward/Rogers Creek Fault within 30 years of the study (2007–2037).⁷

■ **Seismic Hazards**

Ground Shaking

The intensity of the seismic shaking during an earthquake depends on several factors, including the distance and direction to the earthquake’s epicenter, the magnitude of the earthquake, and the area’s geologic conditions. An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the Project site, similar to that which has occurred in the past. According to the Association of Bay Area Governments’ Earthquake Hazards map for San Francisco and the San Francisco General Plan’s Ground Shaking Intensity map, the Project site would be subject to “strong” shaking intensity and “objects fall” damage during a characteristic earthquake M 7.9 on the San Andreas fault.⁸ During a characteristic earthquake M 7.1 on the Rodgers Creek and Northern segments Hayward fault, the Project site would be subject to “moderate” shaking and “objects fall” damage.⁹

Ground Rupture

Ground rupture occurs when movement on a fault deep in the earth breaks through to the ground surface. There are no known active faults crossing the Project site, and because the Project site is not located within an Alquist-Priolo Earthquake Fault Zone, ground rupture is unlikely.¹⁰

Ground Lurching

Ground lurching is a result of the rolling motion imparted to the ground surface during energy released by an earthquake. Such rolling motion can cause ground cracks to form in weaker soils. The potential for the formation of these cracks is considered greater at contacts between deep alluvium

⁷ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

⁸ Association of Bay Area Governments, *Earthquake Hazard Map for San Francisco, Scenario: Entire San Andreas Fault System in Earthquake Hazard Maps*, <http://www.abag.ca.gov/cgi-bin/pickmapx.pl> (updated October 20, 2003).

⁹ Association of Bay Area Governments, *Earthquake Hazard Map for San Francisco, Scenario: Rodgers Creek–North Hayward Earthquake Magnitude 7.1 Hazard Maps*, <http://www.abag.ca.gov/cgi-bin/pickmapx.pl>.

¹⁰ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

and bedrock. Ground lurching is possible at the site, as in other locations in the Bay Area, but based on the site location, the offset is expected to be very minor.¹¹

Lateral Spreading

Lateral spreading is a failure within weaker soil material, which causes the soil mass to move toward a free face or down a gentle slope due to liquefaction. In general, the site has a low susceptibility to liquefaction, and lateral spreading is unlikely.¹²

Liquefaction

Soil liquefaction is a phenomenon under which saturated, loose soils experience a temporary loss of shear strength when subjected to the wave-like shear stresses caused by earthquake ground shaking. The site is located outside of the State of California Seismic Hazard Zones for areas that may be susceptible to liquefaction, as shown on Figure 4.16-2. During geotechnical exploration of the site, groundwater was not encountered, and soil types known to be susceptible to liquefaction were not found.¹³

Settlement

Densification of loose sand above the groundwater level during earthquake shaking could cause settlement of the ground surface. In addition, densification of liquefiable soils below the groundwater level can cause detrimental settlement at the ground surface. As discussed above, loose layers of fill and soil susceptible to this type of densification were encountered on the site.¹⁴

■ Slope Stability/Landslides

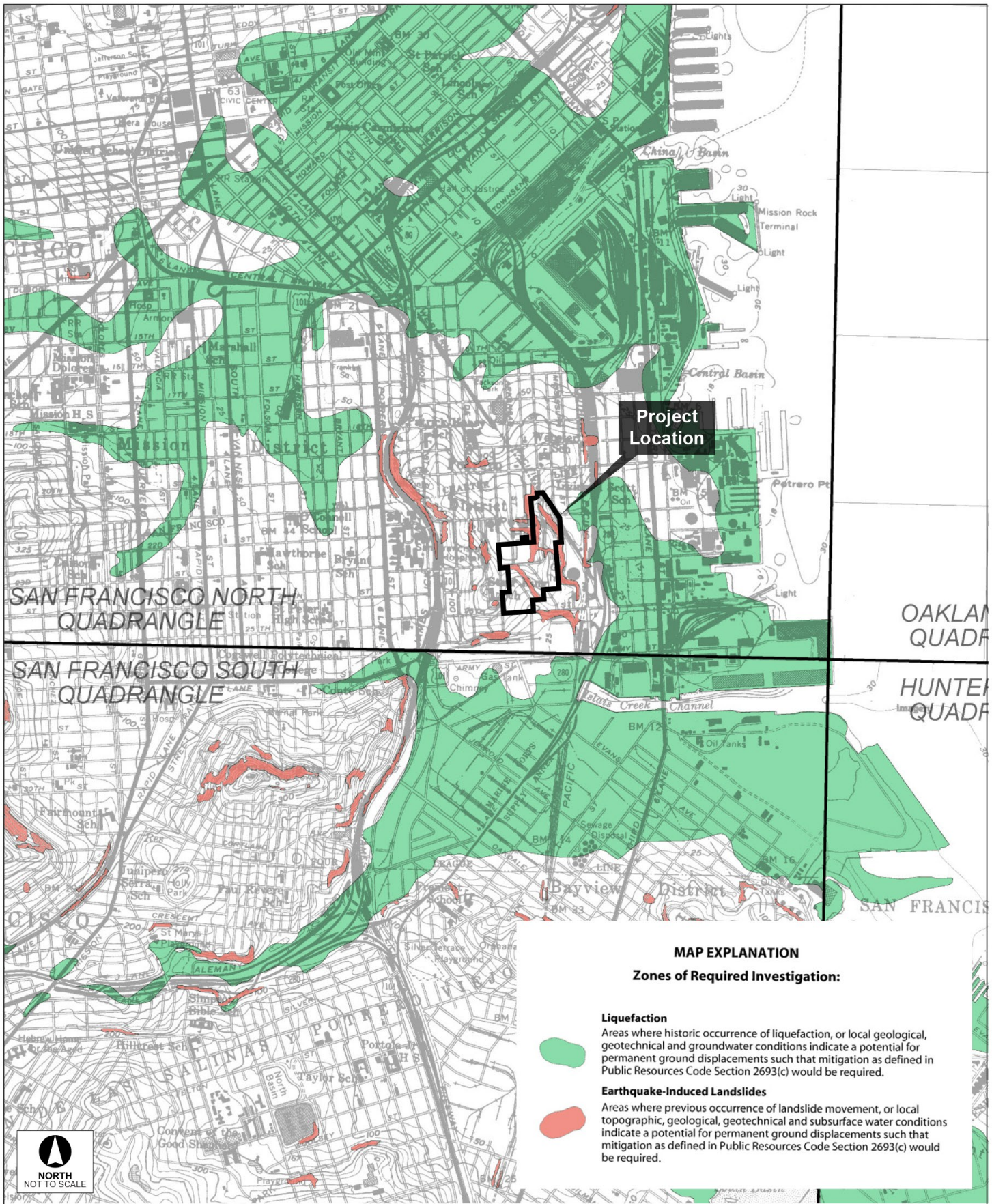
Slope failures include many phenomena that involve the downslope displacement and movement of material, such as landslides, rockfall, debris slides, and soil creep, and can be triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Slope stability depends on several complex variables,

¹¹ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹² ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹³ Exploratory borings and test pits were excavated to depths ranging from approximately 3 feet to 16.5 feet below grade. ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁴ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.



SOURCE: California Department of Conservation, 2000.

POTRERO HOPE SF MASTER PLAN (CASE NO. 2010.0515E)
FIGURE 4.16-2: SEISMIC HAZARD ZONES

such as the geology, structure, and amount of groundwater, as well as external processes such as climate, topography, slope geometry, and human activity. Landslides and other slope failures may occur on slopes of 15 percent or less; however, the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and offset surfaces.

As shown in Figure 4.16-2, the northwest/southeast-trending slope between Connecticut Street and Dakota Street is indicated on the State of California Seismic Hazard Zone map as an area that may be susceptible to seismically induced landsliding. The areas mapped as having the potential for seismically induced landsliding appear to consist of steeper existing slopes.¹⁵

■ **Soil Creep**

Soil creep is a slow down-slope movement of soil that occurs with the annual cycle of wetting and drying under the influence of gravity. The rate of soil creep down a slope depends on the steepness (gradient) of the slope, water absorption and content, type of sediment and material, and vegetation. Clayey soils, as found on the Project site, on steeper natural slopes are susceptible to soil creep.¹⁶

■ **Soils**

Overall, the geologic setting is one of high variability, which is common in Franciscan bedrock.¹⁷ This variability contributes to surface geology at the Project site, which is mapped as slope debris and ravine fill,¹⁸ and the underlying soil types and characteristics. Subsurface conditions at the Project site were evaluated by drilling exploratory borings and excavating exploratory test pits at various locations throughout the Project site. The exploratory borings and test pits revealed a layer of colluvium¹⁹ ranging from 6 to 11 feet in thickness. The results also indicate that previous grading activities at the Project site resulted in the placement of fill in areas of the site. Fill was also placed on portions of the slope east of the northern limits of Texas Street and east of the Missouri Street and Texas Street intersection. In general, fill at the Project site consists of silty clay and sand and clayey silt and sand ranging in thickness from 1 to 8 feet. Analysis of the borings and test pits conducted

¹⁵ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009), Figure 4. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁶ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁷ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁸ ENGEO Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁹ Colluvium refers to silty clay materials transported by erosion from slopes and ridges that are typically deposited in swales.

suggest that the fills were compacted during placement, but it is unlikely that they meet current standards for engineered fill design.²⁰

Serpentine bedrock is present on existing cut slopes and in sporadic outcrops within and immediately adjacent to the site. The most extensive areas of serpentine outcrops occur as linear features on the south side of 26th Street, on the west side of Wisconsin Street south of Carolina Street, along 23rd Street, and along Texas Street. Serpentine bedrock was also encountered in each of the exploratory borings and test pits at a minimum depth of 2.5 feet below ground surface and at maximum depths of 11 to 15 feet in the area of fill along Connecticut Street. The serpentine bedrock varies in terms of engineering and geologic characteristics.²¹

■ **Expansive Soils**

Expansive soils are characterized by their potential “shrink-swell” behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in certain fine-grained clay sediments from the process of wetting and drying. This can cause heaving and cracking of slabs on grade, pavements, and foundations. Structural damage typically occurs over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. The Project site contains highly expansive colluvial soil and slope wash beneath the fill along Connecticut Street.²²

■ **Topography**

The topographic relief of the Project site is very steep in places, with grades exceeding 30 percent in some locations. The highest site elevation is located at the intersection of 23rd Street and Arkansas Street in the northern portion of the site, at 265 feet above mean sea level. The lowest topographic elevation of 40 feet above msl is in the southern portion of the Project site at the intersection of 26th Street and Connecticut Street.²³

²⁰ ENGeo Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

²¹ ENGeo Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009), Figure 5. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

²² ENGeo Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

²³ ENGeo Incorporated, *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA* (July 10, 2009). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

4.17 HYDROLOGY AND WATER QUALITY

4.17.1 Introduction

This section describes the local climate, hydrology, drainage, flooding potential, water quality, and groundwater within the immediate vicinity of the Proposed Project. Data for this section of the Draft EIR/EIS was obtained through review of existing environmental documents for San Francisco, available online data, and the geotechnical investigation¹ prepared for the Proposed Project. The geotechnical investigation is included as Appendix 4.16.

No comments were received during the Notice of Preparation (NOP) or during the Notice of Intent (NOI) comment period regarding the potential for development of the Project site to result in significant impacts related to hydrology and water quality.

4.17.2 Existing Conditions

■ Climate and Precipitation

San Francisco is considered semiarid with a moderate, Mediterranean climate characterized by cool, dry summers and mild, wet winters. The approximate annualized average high temperature is 64 degrees Fahrenheit (°F); the average low temperature is 51°F. Annual rainfall for areas in San Francisco during the period between 1948 and 2008 averaged approximately 20 inches, 95 percent of which occurred during the winter rainy season (October–April), with the heaviest rainstorms typically occurring in December, January, and February.²

The amount of precipitation likely to fall during a two-year, six-hour event (i.e., the most extreme storm expected to occur over six hours in any given two-year period) is estimated to be 1.3 inches, and the 100-year, six-hour precipitation event (the most extreme storm expected to occur over six hours in any given 100-year period) is estimated to be 2.3 inches.³ During the period of record, annual rainfall has varied from 8.7 inches (1976) to 43.8 inches (1983), with a one-day high of 5.5 inches of precipitation on November 5, 1994.

¹ ENGEO Incorporated. 2009. *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA*. July 10. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

² Western Regional Climate Center. 2013. *General Climate Summary: San Francisco Richmond Station (047767)*. Available: <www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7767>. Accessed: June 3, 2014.

³ NOAA. 2013. *Precipitation-Frequency Atlas of the Western United States, Volume XIV* Available: <http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas14_Volume8.pdf>. Accessed: June 3, 2014.

■ Local Topography, Physiography, and Drainage

The Project site is characterized by steep slopes and hilly topography with grades in some locations exceeding 30 percent. The highest topographic elevation is to the north at the intersection of 23rd Street and Arkansas Street at 265 feet above mean sea level (msl) and the lowest elevation is to the south at the intersection of 26th Street and Connecticut Street at 40 feet above msl.⁴ There are no natural drainage features on or adjacent to the Project site. The Proposed Project is located within the Islais Basin, one of San Francisco's eight watershed basins.⁵

■ Stormwater Runoff

Most stormwater runoff in San Francisco is collected via a combined sewer system managed by the San Francisco Public Utilities Commission (SFPUC). Because of development and other land use changes within San Francisco, few creeks or streams flow within the city; most surface water features have been replaced by the city's combined sanitary sewer/storm drain system. This system combines stormwater runoff and wastewater flows in the same network of pipes, conveying flows to facilities where they are treated prior to discharge to the San Francisco Bay or the Pacific Ocean through outfall structures along the shoreline. Discharges from the combined sewer system are regulated under two individual National Pollutant Discharge Elimination System (NPDES) permits (waste discharge requirements [WDRs]) issued by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). The applicable NPDES permit/WDR is discussed in Section 5.17.

Stormwater runoff from the Project site and other locations within the Islais Basin, along with wastewater, is conveyed through the combined sewer system to the Southeast Water Pollution Control Plant (SWPCP) and, after secondary treatment (removal of settleable materials and partial removal of dissolved materials), into San Francisco Bay.⁶ During dry weather, wastewater and any dry weather runoff (e.g., from irrigation runoff, discharge from underground springs, or pipe leaks) from the eastern portions of San Francisco is conveyed to the SWPCP. The SWPCP treats approximately 67 million gallons per day (mgd) during dry weather (approximately 80 percent of San Francisco's total wastewater flow) and has the capacity to treat 150 mgd to secondary-treatment standards. Treated wastewater is then discharged through the SWPCP's deep-water outfall at Pier 80 into San Francisco Bay.⁷ If the combined wet-weather flows exceed 150 mgd, the SWPCP can

⁴ ENGEO Incorporated. 2009. *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA*. July 10. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

⁵ San Francisco Public Utilities Commission. 2011. *Maps and Resources: Islais Creek Basin*, pp. 1–5. Available: <http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/MTO_ID/565>. Accessed: March 24, 2011.

⁶ City and County of San Francisco Public Utility Commission. 2009. *Stormwater Management Plan: Annual Report*, p. 3. Available: <http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/MTO_ID/542>. Accessed: April 18, 2011.

⁷ San Francisco Public Utilities Commission. 2011. *Making Dirty Water, Clean Again*. Available: <http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/117/MTO_ID/670#LIQUIDTREATMENT>. Accessed: March 24, 2011.

also treat an additional 100 mgd to a primary-treatment standard (removal of settleable materials) plus subsequent disinfection and dechlorination.⁸ Wet-weather flows that are treated to the primary standard (plus disinfection) are only discharged from the Pier 80 outfall, while flows treated to the secondary standard and disinfected are discharged through the Quint Street Outfall to the Islais Creek Channel when the plant's maximum capacity is reached. During larger storm events, excess flows that cannot be treated at the SWPCP are treated and discharged through the Bayside Wet Weather Facilities (BWWFs), which consist of a series of interconnected underground tanks, tunnels, and outfall structures. During dry weather, the BWWFs transport combined wastewater to the SWPCP. During wet weather, underground transport tunnels provide a total storage capacity of approximately 193 million gallons, while pumps continue to transfer combined wastewater and stormwater to the SWPCP. Section 4.13, *Utilities and Service Systems*, contains additional information about the combined storm drainage and wastewater infrastructure.

■ Stormwater Runoff Quality

As stormwater runoff water flows over various surfaces (streets, sidewalks, rooftops, vegetation, etc.), it picks up dissolved chemicals, particulate material, and gross surface debris before being discharged into the stormwater drainage system, and ultimately into a water body. The effects of this runoff water on surface water quality depend on the amount and type of material being picked up and transported, as well as the amount of water or flow rate in the receiving water. Constituents and concentrations within runoff water vary according to land cover, land use, topography, and the amount of impervious cover, as well as the intensity and frequency of irrigation or rainfall. Runoff from undeveloped areas will reflect the natural chemistry and ecology of the watershed. Runoff in developed areas may typically contain oil, grease, and metals accumulated in streets, driveways, parking lots, and rooftops, as well as pesticides, litter, herbicides, particulate matter, nutrients, animal waste, and other oxygen demanding substances from landscaped areas. Runoff from open space areas and parks may typically contain nutrients, pesticides, organic debris, bacteria, and sediment.

The Project site is in an area that consists of a mix of residential, commercial, industrial, and recreational land uses. There are no data on pollutant loads generated in the surface runoff from the Project site; thus, stormwater runoff quality is assumed to be typical of those associated with common urban uses, as noted above. The typical pollutants generated within urban land use areas consist of oil, grease, metals, litter, sediments, pesticides, and nutrients (e.g., phosphorous, nitrogen) from fertilizers. The nonpoint-source pollutants generated within the Project site are picked up by rainfall as it runs off the impervious surfaces and enters the combined sewer system. Upon reaching the SWPCP, many of these pollutants are removed from storm flows before final discharge into San

⁸ San Francisco Redevelopment Agency and San Francisco Planning Department. 2010. *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Final Environmental Impact Report*. June. Redevelopment Agency File No. ER06.05.07, Planning Department File No. 2007.0946E, State Clearinghouse No. 2007082168.

Francisco Bay. However, as discussed above, storm flows are combined with continually present wastewater flows; during rain events, total flows can reach quantities that overwhelm the existing sewer system, potentially resulting in the direct discharge of partially treated wastewater and stormwater into the Bay, the ocean, or both. These combined-sewer overflow (CSO) events not only present a public-health danger caused by bacterial contamination, but they can also disrupt ecosystem function when nutrients are discharged.

■ Groundwater

The Project site is within the San Francisco Bay Hydrologic Region, which covers approximately 2.88 million acres (4,500 square miles), including all of San Francisco.⁹ The region has 28 identified groundwater basins, and the Proposed Project is located within the Islais Valley groundwater basin (Islais Basin). During geotechnical exploration, groundwater was not encountered at the Project site.¹⁰ Groundwater is not used for any purpose at the Project site.

In general, groundwater quality throughout most of the San Francisco Bay Hydrologic Region is suitable for most urban and agricultural uses, with only local impairments. The primary constituents of concern are high total dissolved solids, nitrate, boron, and organic compounds.¹¹

■ Flood Hazards

The Project site is not located in a designated floodplain. The Project site is not within a 100-year special flood hazard zone,¹² nor is it susceptible to tsunamis, seiches, or climate change-induced sea level rise due to its inland location and elevation. Dam failure inundation also does not pose a threat to the Project site because San Francisco is not located in a dam failure inundation area.¹³

⁹ California Department of Water Resources. 2003. *California's Groundwater*. Bulletin 118, p. 31. Sacramento, CA.

¹⁰ ENGEO Incorporated. 2009. *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA*. July 10. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹¹ California Department of Water Resources. 2003. *California's Groundwater*. Bulletin 118, Chapter 7 (San Francisco Bay Hydrologic Unit), p. 132. Available: <http://www.water.ca.gov/pubs/groundwater/bulletin_118/california's_groundwater_bulletin_118_update_2003_bulletin118_2-sf.pdf>. Accessed March 24, 2011.

¹² Federal Emergency Management Agency. 2008. *San Francisco's Interim Floodplain Maps—Citywide*, Final Draft. July. Available: <<http://sfgsa.org/Modules/ShowDocument.aspx?documentid=1761>>. Accessed March 28, 2011.

¹³ Association of Bay Area Governments. 2011. *Flooding Maps and Information: Dam Failure Inundation Hazard Map for San Francisco*. August. Available: <<http://quake.abag.ca.gov/floods/>>.

4.18 HAZARDS AND HAZARDOUS MATERIALS

4.18.1 Introduction

This section describes the available information about hazardous materials¹ in the environment and structures at and adjacent to the Project site and other hazards. Historic and current land uses are summarized in this section, based on the two following reports: *Phase I Environmental Site Assessment (ESA) and Limited Asbestos and Lead Paint Sampling Report for the Potrero Annex and Potrero Terrace* (hereinafter referred to as Project Phase 1 ESA)² and *Phase I ESA 1101 Connecticut Street Report for Block X* (hereinafter referred to as Block X Phase 1 ESA).³ The Phase I ESAs and other relevant correspondence are included in Appendix 4.18.

To determine the potential for hazardous materials to occur at the Project site, the ESAs included the following elements: site reconnaissance; topography, geology, soils, hydrology, and water quality survey; off-site source survey; historical site and site vicinity land use review; review of regulatory databases, and a limited asbestos and lead paint sampling analysis. The primary objective of the ESAs was to assess the likelihood of recognized environmental conditions (RECs) at the Project site as a result of current or historical land uses on or around the Project site, and/or from a known and reported off-site source.⁴

Several comments were received during the Notice of Preparation (NOP) comment period regarding the accidental release of hazardous materials from construction-related activities. Comments were received regarding potential disturbance of naturally occurring asbestos (NOA), lead-based paint (LBP), and asbestos-containing materials (ACMs). In addition, commenters raised concerns regarding the proximity of the Project site to nearby schools and implementation of mitigation to

¹ The term “hazardous material” is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. It includes hazardous waste.

² SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

³ LEE Incorporated. 2013. *Phase I Environmental Site Assessment 1101 Connecticut Street, San Francisco, CA*. April 8. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

⁴ “Recognized environmental conditions,” as defined by ASTM, include the presence or likely presence of hazardous substances or petroleum products on a property that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water on the property. However, the term is not intended to include *de minimis* conditions. A condition considered *de minimis* is not a recognized environmental condition. It is an environmental condition that does not generally present a material risk of harm to the public health or the environment and that generally would not be subject to an enforcement action if brought to the attention of appropriate governmental agencies.

reduce potential impacts related to the aforementioned hazards. Comments received during the Notice of Intent (NOI) comment period included concerns over ACMs. These topics are addressed in Section 5.18, *Hazards and Hazardous Materials*.

4.18.2 Environmental Setting

■ Historic Uses

Built in two phases in 1941 and 1955, the Project site is composed of two of the oldest public housing developments in San Francisco, Potrero Terrace and Potrero Annex. Together, these public housing developments house a population of approximately 1,200 people. Research indicates that prior to the construction of the Potrero Terrace buildings in 1941, the Project site was undeveloped.⁵ From 1940 through 1990, Block X, located at the intersection of 25th Street and Connecticut Street, on the south slope of Potrero Hill District, served as a children's nursery and child development center. In 1990, the center closed, and the building was removed following extensive damage when a truck crashed into the building. North of the former building site is a sloped grassy surface with no structures.⁶

■ Current Uses

The current use of the Potrero Terrace and Potrero Annex sites is a multi-family public housing development including multi-story residential buildings, a roadway/pedestrian network, parking, an administrative office, a Family Resource Center, and a child care center. There are 38 residential buildings on the Potrero Terrace site and 23 residential buildings on the Potrero Annex site. There are currently no retail, commercial, or industrial uses onsite.

As is common for multi-family residential developments, hazardous materials used and/or stored at the Project site are limited to cleaning/janitorial supplies and general maintenance supplies such as paint, paint thinner, liquid laundry bleach, stain cleaner, fabric softener, and gasoline. The Project Phase I ESA states that no obvious indications of the generation of hazardous wastes were observed during the site reconnaissance on June 10, 11, and 12, 2009.

In addition, the Project Phase I ESA determined that the release of hazardous materials at the Project site is limited to negligible quantities of automotive lubricants on asphalt and concrete pavement in the parking areas. A file review indicated that the Potrero Annex and Potrero Terrace properties are

⁵ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

⁶ LEE Incorporated. 2013. *Phase I Environmental Site Assessment 1101 Connecticut Street, San Francisco, CA*. April 8. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

not listed in the San Francisco Department of Public Works Bureau of Environmental Health and Management, San Francisco Department of Public Works Underground Tanks Division/Hazardous Materials Unified Program, or in the San Francisco Department of Public Health (DPH) as a site with recognized environmental conditions.⁷

Block X is currently in disuse. There is a basketball court and concrete foundation of a former building. The concrete, on the southern portion of the property, represents the foundation of a one-story building that occupied the area until the early 1990s.⁸

Surrounding land uses include a variety of residential, commercial, recreational, institutional, and industrial uses. Also in the vicinity are Potrero Hill Recreation Center and Starr King Elementary School.⁹

■ **Schools within One-quarter Mile of the Project Site**

There are two schools located within 0.25 mile of the Project site. Starr King Elementary is located approximately 0.05-mile west of the Project site. The Research In Special Education Institute is approximately 0.14-mile south of the Project site.

■ **Airport Safety Zone**

San Francisco International Airport (SFO) is approximately 8.5 miles south and Oakland International Airport is approximately 9.5 miles east of the Project site. The Project site is not located within the SFO or Oakland land use plan or within their maps of height restrictions, in accordance with Federal Aviation Administration Part 77, *Objects Affecting Navigable Airspace*. The Project site is, therefore, outside any airport safety or clear zones. In addition, due to the distance to the nearest airport, no portion of the Project site is within a Federal Aviation Administration (FAA) Part 77-defined Runway Object Free Area or Runway Safety Area.

■ **Potentially Contaminated Site within One Mile of the Project Site**

The Block X Phase I and Project Phase I reports identified petroleum hydrocarbon and hazardous materials release sites within a 1-mile radius of the site. The sites associated with soil or groundwater contamination are relatively distant from the Project site, and are either closed or mitigated cases or had releases limited to their property boundaries. The Block X Phase I and Project

⁷ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

⁸ LEE Incorporated. 2013. *Phase I Environmental Site Assessment 1101 Connecticut Street, San Francisco, CA*. April 8. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

⁹ Starr King Elementary School is within 0.25 mile of the Project site.

Phase I reports did not identify a site within a 1-mile radius where the plume of contaminated soil or groundwater extends to the vicinity of the Project site.^{10,11}

■ **Soil Investigation on the Project Site**

The Block X Phase 1 and Project Phase I ESA did not involve soil investigation. The potential to encounter contaminated soils in the Project site is discussed in the *Hazardous Building Materials* section below.

■ **Regulatory Database Review**

As part of the Phase I ESAs, local, state, and federal regulatory databases were reviewed to determine whether there are any on- or off-site facilities that would be considered recognized environmental conditions (RECs) that could affect the site. Within the search radius, the Project Phase 1 listed 145 locations and the Block X Phase 1 listed 111 locations in various federal, state, or tribal databases. Table 4.18-1 provides a summary of the databases searched and the facilities in the search radius of Potrero Terrace and Potrero Annex. Table 4.18-2 provides a summary of the database review for Block X.

Table 4.18-1 Summary of Database Review for Potrero Terrace and Potrero Annex

<i>Federal or State Government Database</i>	<i>Search Radius</i>	<i>Number of Reported Facilities</i>	<i>On Project Site</i>	<i>Adjacent to the Project Site</i>
No Further Remedial Action Planned (NFRAP)	0.50 mile	7	No	No
Resource Conservation and Recovery Act-Corrective Action (RCRA COR ACT)	1.00 mile	1	No	No
RCRA Generators (RCRA GEN)	0.25 mile	20	No	Yes
Federal Engineering and Institutional Controls (IC/EC)	0.25 mile		No	No
Emergency Response Notification System (ERNS)	0.25 mile	2	No	No
State/Tribal Sites	1.00 mile	14	No	No
State/Tribal solid waste list (SWL)	0.50 mile	4	No	No
State/Tribal leaking underground storage tanks (LUST)	0.50 mile	85	No	Yes
State/Tribal underground/aboveground storage tanks (USTs/ASTs)	0.125 mile	5	No	No
State/Tribal voluntary cleanup program (VCP)	0.50 mile	2	No	No
State Permits	0.125 mile	5	No	Yes

SOURCE: SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling*. August 7. Sacramento, CA.

¹⁰ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹¹ LEE Incorporated. 2013. *Phase I Environmental Site Assessment 1101 Connecticut Street, San Francisco, CA*. April 8. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

Table 4.18-2 Summary of Database Review for Block X

<i>Federal or State Government Database</i>	<i>Search Radius</i>	<i>Number of Reported Facilities</i>	<i>On Project Site</i>	<i>Adjacent to the Project Site</i>
No Further Remedial Action Planned (NFRAP)	0.50 mile	4	No	No
Resource Conservation and Recovery Act-Corrective Action (RCRA COR ACT)	1.00 mile	0	No	No
RCRA Generators (RCRA GEN)	0.25 mile	7	No	Yes
Federal Engineering and Institutional Controls (IC/EC)	0.25 mile		No	No
Emergency Response Notification System (ERNS)	0.25 mile	0	No	No
State/Tribal Sites	1.00 mile	25	No	No
State/Tribal solid waste list (SWL)	0.50 mile	2	No	No
State/Tribal leaking underground storage tanks (LUST)	0.50 mile	64	No	Yes
State/Tribal underground/aboveground storage tanks (USTs/ASTs)	0.250 mile	4	No	No
State/Tribal voluntary cleanup program (VCP)	0.50 mile	1	No	No
State Permits	0.250 mile	4	No	Yes

SOURCE: LEE Incorporated. 2013. *Phase I Environmental Site Assessment 1101 Connecticut Street*. April 8. San Francisco, CA.

According to the Project and Block X Phase I ESAs, the Project site is not listed as a hazardous materials/wastes site (Cortese List), and there are no listed facilities on regulatory databases on the Project site. The Phase I ESAs also determined that it is unlikely that any of the surrounding hazardous materials/wastes sites could contribute to a REC on the Project site.^{12,13,14}

■ Hazardous Building Materials

As described above, there are currently 38 residential buildings on the Potrero Terrace site and 23 residential buildings on the Potrero Annex site, constructed in 1941 and 1955, respectively, and concrete foundations of a former children's nursery and child development center on Block X. Like many older buildings, these structures may contain building materials that can be hazardous to people and the environment once disturbed. Typical hazardous materials in buildings and concrete

¹² SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment*, San Francisco, CA. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹³ Following removal of underground storage tanks (UST) in the 1990s, testing indicated soil and groundwater had been contaminated with petroleum products at Yellow Cab Cooperative, 1200 Mississippi Street, south of the site. The site was remediated, and SFDPH issued a case closure letter in 2009.

¹⁴ LEE Incorporated. 2013. *Phase I Environmental Site Assessment 1101 Connecticut Street*, San Francisco, CA. April 8. San Francisco, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

foundations of this age include lead-based paint (LBP) and asbestos in non-structural building materials, polychlorinated biphenyls (PCBs), and mercury fixtures and equipment.¹⁵

Lead-Based Paint

Prior to the U.S. Environmental Protection Agency (USEPA) ban in 1978, LBP was commonly used on interior and exterior building surfaces. Through such disturbances as sanding and scraping activities, renovation work, or gradual wear and tear, old peeling paint or paint dust particulates have been found to contaminate surface soils or cause lead dust to migrate and affect long-term indoor air quality. Exposure to lead can cause severe adverse health effects, especially in children. Results of a survey completed during the Project Phase I ESA indicated that existing buildings at the Project site contain U.S. Department of Housing and Urban Development (HUD)-defined LBPs, with lead concentrations greater than 600 mg/kg. According to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) guidelines, coatings, or materials containing lead at concentrations equal to or exceeding 600 mg/kg may constitute a health hazard for employees engaged in lead-related construction work.¹⁶

The Project Phase I ESA also noted the potential exists for the presence of elevated concentrations of lead in the soil around buildings due to the historic use of LBP, which may have leached from the exterior of the structure as the paint weathered and aged. The scraping and sanding of LBP during maintenance and repainting of the exteriors of existing buildings over time may also have contributed to the lead content of the soil in the immediate vicinity. Soil testing was not performed, and the Project Phase 1 concluded it is possible lead concentrations may exceed published health risk guidelines and other environmental standards.¹⁷ In 2011, the project applicant submitted a work plan to the San Francisco Department of Public Health (SFDPH) outlining a process to test for lead (and other contaminants in soils). In response, the SFDPH identified additional specific steps that must be taken to address potential soil contamination around the buildings before soil-disturbing

¹⁵ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁶ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

¹⁷ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

activities can begin.¹⁸ Those requirements are presented as mitigation in the impact analysis in Impact HZ-2 in Section 5.18, *Hazards and Hazardous Materials*.

The Block X Phase 1 found that lead-based paint could occur in the shallow soil around the perimeter of the concrete foundation and pose little risk. However, earthmoving activities on the site could expose workers to lead-based paint residues in the soil, so the Block X Phase 1 ESA recommended a management plan to minimize the potential risk to workers. These recommendations are discussed further in Section 5.18, *Hazards and Hazardous Materials*.

Asbestos

Asbestos is a naturally occurring fibrous material that was extensively used as a fireproofing and insulating agent in building construction materials before such uses were banned by the USEPA in the 1970s. Asbestos was commonly used for insulation of heating ducts as well as ceiling and floor tiles, among typical types of materials. When contained within building materials, asbestos fibers present no significant health risk, but once those tiny fibers (that cannot be seen with the naked eye) are disturbed, they can become airborne. Once they are inhaled they can become lodged in the lungs, potentially causing increased incidence of lung disease or other pulmonary complications.

There are no buildings on Block X to warrant an environmental concern associated with ACM. Potrero Terrace and Potrero Annex were both developed prior to the USEPA ban on the use ACMs in building construction. The asbestos evaluation conducted as part of the Project Phase I ESA indicates that several of the material samples taken from existing buildings on the Project site contain ACM. Further testing will be necessary prior to demolition of existing buildings to identify the extent of ACM so that it can be removed and disposed of in accordance with applicable regulations. In addition, soils around buildings will also need to be tested.¹⁹

Polychlorinated Biphenyl (PCB) and Mercury

PCBs are petroleum-based oils that were formerly used primarily as insulators in many types of electrical equipment, including transformers and capacitors. Older light ballasts and fluorescent light bulbs can also contain PCBs. After PCBs were determined to be carcinogenic in the 1970s, USEPA banned PCB use in most new equipment and began a program to phase out certain existing PCB-containing equipment. The Project Phase I ESA noted there are light ballasts and bulbs in at

¹⁸ City and County of San Francisco, Department of Public Health Environmental Health Section. 2012. "Review of Environmental Documents Potrero Annex and Potrero Terrace, Hope Project, San Francisco. DPH SAM 818" – letter from Rajiv Bhatia, Director, Occupational and Environmental Health, to Charmaine Curtis, Curtis Development & Consulting (February 29, 2012) (see Appendix 4.18).

¹⁹ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

least one building, but they were not labeled for PCB content, and recommended those items be tested for PCB content prior to removal and building demolition.

Spent fluorescent light tubes, thermostats, and other electrical equipment contain heavy metals that, if disposed of in landfills, can leach into soil or groundwater. Fluorescent light tubes typically contain concentrations of mercury that may exceed regulatory thresholds for hazardous waste and, therefore, must be managed in accordance with hazardous waste regulations. Elemental mercury can be found in many electrical switches, and when disposed of, such mercury is considered hazardous waste. The Project Phase I ESA suggested building thermostats could contain mercury, and those features should be properly removed and disposed of prior to demolition.²⁰ PCBs were not noted as a contaminant of concern in the Block X Phase I.

■ Naturally Occurring Asbestos

As noted in Section 4.16, *Geology and Soils*, serpentine bedrock is present on existing cut slopes and in sporadic outcrops within and immediately adjacent to the site. The most extensive areas of serpentine outcrops occur as linear features on the south side of 26th Street, on the west side of Wisconsin Street south of Carolina Street, along 23rd Street, and along Texas Street. Serpentine bedrock is also in underlying materials at a minimum depth of 2.5 feet below ground surface and at maximum depths of 11 to 15 feet in the area of fill along Connecticut Street.²¹ Serpentine rock can contain concentrations of NOA²² at concentrations less than one percent up to approximately 25 percent. Laboratory analysis indicates that the serpentine bedrock at the Project site contains chrysotile, a mineral found in asbestos, as a result of the weathering of serpentine found within the underlying Franciscan bedrock.²³

As long as chrysotile and other asbestos minerals are not disturbed and fibers are not released into the air, no health risk exists. However, through construction activities such as excavation and grading, as well as natural weathering processes, NOA can be released into the air. Exposure to airborne asbestos fibers from NOA may result in similar health effects as described above for ACM.

²⁰ SCS Engineers. 2009. *Phase I Environmental Site Assessment and Limited Asbestos and Lead Paint Sampling, Potrero Terrace and Potrero Annex Redevelopment, San Francisco, CA*. August 7. Sacramento, CA. This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

²¹ ENGEO Incorporated. 2009. *Geotechnical Exploration: Potrero Annex and Terrace Redevelopment San Francisco, CA, Figure 5*. July 10. (see Appendix 4.16). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

²² "Asbestos" is a term used for several types of naturally occurring fibrous minerals found in many parts of California.

²³ ENGEO Inc. 2009. *Geotechnical Exploration, Potrero Annex and Terrace Redevelopment San Francisco, CA*. July 10. San Francisco, CA. (see Appendix 4.16). This document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California, as part of Case File No. 2010.0515E.

■ Other Physical Hazards

The Project site is located in an urbanized area that lacks the urban-wildland interface that tends to place new developments at risk in undeveloped areas of California, and the Project site is not located in an area subject to the threat of wildland fires.²⁴ Section 4.14, *Public Services*, contains information regarding fire protection services and response times. The Project site is not situated in a location vulnerable to tsunami or dam failure inundation (see Section 4.17, *Hydrology and Water Quality*).

²⁴ Association of Bay Area Governments. 2011. *Wildland Urban Interface Fire Threat Map for San Francisco*. Available: <<http://www.abag.ca.gov/bayarea/eqmaps/wildfire>>. Accessed: March 18, 2011.

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4.19 MINERAL AND ENERGY RESOURCES

4.19.1 Introduction

This section describes the mineral and energy (oil, gas, and geothermal) resources within and surrounding the city and the Project site. This section also describes the applicable federal, state, and local plans, policies, and regulations associated with management and use mineral and energy resources. No comments on the Notice of Preparation (NOP) relating to mineral and energy resources were received. One comment was received on the Notice of Intent (NOI) relating to the Proposed Project's effect on energy demand and the use of renewable energy sources. This comment is addressed Section 5.19, *Mineral and Energy Resources*.

4.19.2 Environmental Setting

■ Mineral Resources

The city is highly developed with urban uses and is, therefore, not as extensively involved in the conservation of natural resources as are more rural communities. According to the Environmental Protection Element of the City's General Plan, minerals are not found in the city to any appreciable extent and, therefore, are not included in the scope of the Environmental Protection Element.¹ Further, all land in San Francisco, including the Project site, is designated Mineral Resource Zone 4 (MRZ-4) by the California Division of Mines and Geology (CDMG) under the Surface Mining and Reclamation Act of 1975 (CDMG, Open File Report 96-03 and Special Report 146 Parts I and II). This designation indicates that there is inadequate information available for assignment to any other MRZ and, thus, the site is not a designated area of significant mineral deposits. Since the Project site is already developed, future evaluation or designation of the site would not affect, or be affected by, the Proposed Project.

■ Energy Resources

Electricity Use and Supply

Californians consumed 280,032 gigawatt-hours (GWh) of electricity in 2009.² Of this, San Francisco consumed 5,655 GWh, or approximately 2 percent of the total statewide consumption. In 2009, the California electricity mix included natural gas (56.7 percent), coal (1.8 percent), large hydroelectric plants (12.2 percent), and nuclear (15.8 percent). The remaining 13.9 percent was supplied from

¹ San Francisco Planning Department. 2010. *General Plan: Environmental Protection Element*. Available: <http://www.sf-planning.org/ftp/General_Plan/16_Environmental_Protection.htm>. Accessed: April 16, 2012).

² California Energy Commission. 2012. *Energy Consumption Data Management Service, Electricity Consumption by County*. Available: <<http://ecdms.energy.ca.gov/elecbycounty.aspx>>. Accessed: April 17, 2012.

renewable resources such as wind, solar, geothermal, biomass, and small hydroelectric facilities.³ In 2002, California established its Renewable Portfolio Standard program⁴ with the goal of increasing the annual percentage of renewable energy in the state's electricity mix by the equivalent of at least 1 percent of sales, with an aggregate total of 20 percent by 2017. The California Public Utilities Commission subsequently accelerated that goal to 2010 for retail sellers of electricity (Public Utilities Code Section 399.15(b)(1)). Then-governor Schwarzenegger signed Executive Order S-14-08 in 2008, increasing the target to 33 percent renewable energy by 2020. In September 2009, California's commitment to the Renewable Portfolio Standard continued with Executive Order S-21-09, which directs the Air Resources Board under its Assembly Bill (AB) 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020. In September 2010, the California Air Resources Board adopted its Renewable Electricity Standard regulations, which require all of the state's load-serving entities to meet this target. Additional energy-efficiency measures are needed to meet these goals as well as the AB 32 greenhouse gas (GHG) reduction goal of reducing statewide GHG emissions to 1990 levels by 2020.

Electricity Providers

Pacific Gas and Electric. San Francisco receives most of its electricity from Pacific Gas and Electric Company (PG&E). PG&E has an electricity generation portfolio that totals approximately 6,870 megawatts.⁵ In total, the 2009 PG&E power mix consisted of natural gas (34.6 percent), coal (1.3 percent), large hydroelectric plants (13.0 percent), nuclear (20.5 percent), eligible renewable resources (14.4 percent), other fossil fuel (1.2 percent), and unspecified sources (15 percent).

Renewable Portfolio Standard-eligible renewable resources⁶ used include geothermal (29.7 percent), biomass and waste (30.1 percent), small hydroelectric (17.8 percent), wind (22.3 percent), and solar (less than 1 percent). In 2009, PG&E's retail customers purchased 108,503 GWh of electricity.⁷ PG&E provides the San Francisco Public Utilities Commission (SFPUC) Power Enterprise with

³ California Energy Commission. 2012. *Energy Almanac, California's Major Sources of Energy*. Available: <http://energyalmanac.ca.gov/overview/energy_sources.html>. Accessed: April 17, 2012.

⁴ The Renewable Portfolio Standard is a flexible, market-driven policy to ensure that the public benefits of wind, solar, biomass, and geothermal energy continue to be realized as electricity markets become more competitive. The policy ensures that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state or country.

⁵ Pacific Gas and Electric Company (PG&E), *2009 Corporate Responsibility and Sustainability Report, PG&E's Sustainable Journey, Working Collaboratively to Find the Right Balance for a More Sustainable Future, a Summary*.

⁶ In accordance with the Renewable Portfolio Standard, eligible renewable resources include geothermal facilities, hydroelectric facilities with a capacity rating of 30 megawatts (MW) or less, biomass, selected municipal solid waste facilities, solar facilities, and wind facilities. Two percent of the renewable energy resources used by PG&E in 2008 were not eligible under the Renewable Portfolio Standard because they came from open-market purchases.

⁷ California Energy Commission. 2012. *Energy Consumption Data Management System, Electricity Consumption by Planning Area*. Available: <<http://ecdms.energy.ca.gov/elecbyplan.aspx>>. Accessed: April 17, 2012.

transmission and distribution services west of Newark, pursuant to an Interconnection Agreement regulated by the Federal Energy Regulatory Commission.

SFPUC Power Enterprise. The remainder of San Francisco's electricity is provided by the SFPUC's hydroelectric facilities in the Hetch Hetchy system, operated by the SFPUC Power Enterprise. This system provides a long-term annual average of 1.6 billion kilowatt-hours (kWh) of electrical power and includes 150 miles of high-voltage transmission lines that carry this power from the SFPUC power generation facilities on the Tuolumne River to Newark, where the Hetch Hetchy power system is linked to California's electricity grid. The SFPUC Power Enterprise provides electricity to some of the Hetch Hetchy water system components as well as to all City and County of San Francisco (CCSF) municipal facilities, San Francisco International Airport, Norris Industries (a federal facility), and the Modesto and Turlock Irrigation Districts (for municipal and agricultural water supply pumping).

While the quantity of power produced exceeds the CCSF's municipal power needs on an annual basis, the CCSF must supplement its power sources to meet municipal demand and its contractual obligations during the summer and fall months, when power generation is reduced so that water can be stored in the Hetch Hetchy system for water supply purposes.

Natural Gas

Natural gas is the cleanest of the fossil fuels used in the state and will continue to be a substantial energy source for the foreseeable future.⁸ Estimates of recoverable shale reserves are as high as 842 trillion cubic feet, which would comprise a 37-year supply at today's consumption rates. PG&E operates one of the largest natural gas distribution networks in the country, including 48,850 miles of natural gas transmission and distribution pipelines.⁹ In all, PG&E delivers gas to approximately 4.3 million customer accounts in northern and central California, including San Francisco.

⁸ California Energy Commission. 2009. *2009 Integrated Energy Policy Report, Final Commission Report*. December 2009. Sacramento, CA.

⁹ Pacific Gas and Electric Company. 2009. *2009 Corporate Responsibility and Sustainability Report, PG&E's Sustainable Journey, Working Collaboratively to Find the Right Balance for a More Sustainable Future, a Summary*. December. San Francisco, CA.

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4.20 AGRICULTURAL AND FOREST RESOURCES

4.20.1 Introduction

This section describes the agricultural and forest resources within and surrounding the city and the Project site. No comments were submitted regarding agricultural and forest resources during the Notice of Preparation (NOP) and Notice of Intent (NOI) scoping periods, since none exist on the Project site.

4.20.2 Environmental Setting

■ Agricultural Resources

The city is highly developed with urban uses and is therefore not agricultural in nature. The entire city is identified as “Urban and Built-Up Land” by the California Department of Conservation and does not contain any important farmland.¹ Accordingly, the Project site does not include agricultural lands or resources.

■ Forest Land

There are approximately 700,000 trees in the City, 110,000 of which are street trees.² Trees are an important resource to the people of San Francisco and to the varied wildlife species that use the urban forests within the city. The tree species present throughout the city’s natural areas, discussed further in Sections 4.15 and 5.15, *Biological Resources*, are almost entirely nonnative. No forest land is identified within the City of San Francisco (as defined by Public Resources Code [PRC] Section 12220[g]).

¹ California Department of Conservation (DOC). 2009. *Division of Land Resource Protection, Farmland Mapping and Monitoring Program, Important Farmland in California, 2006*. January. Available: <http://www.conservation.ca.gov/dlrp/fmmp/overview/Documents/fmmp2006_08_11.pdf>. Accessed: June 25, 2012.

² San Francisco Urban Forestry Council. 2012. *Annual Urban Forest Report, July 1, 2009–June 30, 2010*. Available: <<http://sfenvironment.org/article/urban-forestry/annual-urban-forest-reports>>. Accessed: June 25, 2012.

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